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Why do people exhibit different levels of trust between strangers and those who are socially close to them? This study tests the hypothesis that societies with a historical prevalence of infectious diseases develop strategies to minimise contact with potentially unhealthy or contaminated out-groups, while emphasising strong local networks of in-groups to manage infections effectively, ultimately leading to a lower radius of trust. Our empirical analysis verifies that societies with higher historical pathogen prevalence trust less out-groups relatively to in-groups using (i) cross-country; (ii) cross-country individual-level; (iii) ethnic group-level; and (iv) individual-level data for a sample of second-generation migrants. In particular, our findings support a negative association between historical pathogen prevalence and the contemporary radius of trust, specifically when we differentiate attitudes between socially distant groups (e.g., people met for the first time) and family members. Furthermore, this pattern remains consistent when we proxy trust attitudes using historical data on disapproval of violence at the ethnic group level from the Standard Cross-Cultural Sample. We find that an increase in historical pathogen prevalence is associated with a lower disapproval of violence toward out-group members from other societies relative to in-group members from the local community. Overall, historical pathogen prevalence sheds light on a fundamental cultural trait that persists over time.

JEL classification: N00, Z10

Keywords: pathogens; radius of trust; persistence

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1. Introduction

Economic and policy decisions often involve trade-offs between those that we consider distant and those that are socially close to us. Therefore, to understand how a wide variety of economic outcomes are determined, it is important to explore how beliefs about the scope of moral values are formed. This issue has gained considerable attention from pioneering scholars in economics (Tabellini, 2008; Moscona et al., 2017; Enke, 2019; Cappelen et al., 2022; Enke et al., 2023). Recent scholarly contributions have demonstrated that the degree to which individuals exhibit similar altruism and trust towards strangers and in-group members affects political views (Enke, 2020; Enke et al., 2023), home bias in equity investments (Enke et al., 2022), support for climate-protection policies (Andre et al., 2021), and backing for market mechanisms (Landier and Thesmar, 2022).

The radius of trust is a principal trait reflecting the scope of moral values.[1] The relevant literature defines this radius as the difference between out-group and in-group trust (see e.g., Delhey et al., 2011). A wide radius enables productive relationships with socially "remote" individuals, while a narrow radius indicates lack of trust outside family and intimate social circles. Hence, the radius of trust pertains not to a person's overall level of trust, but rather to its slope as a function of social distance (see e.g., Enke et al., 2023 for more details on this).[2] In other words, it captures the difference in the level of trust as we move from socially distant to socially close agents (see e.g., Enke, 2023 for more details on this).

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[1] In the relevant literature, the radius of trust is alternatively referred to as the "scope of trust" (Moscona et al., 2017) or "trust universalism" (Enke et al., 2022; 2023; Cappelen et al., 2022).

[2] Arrow (1972) was among the first to identify the value of trust, and he wrote that 'virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence.'

Despite the growing focus on the scope of trust as a determinant of various socioeconomic and political outcomes, the factors influencing its formation have not been thoroughly investigated. Few studies have investigated why trust is confined to a limited circle of familiar individuals in certain geographical regions, such as within clans in China, India, and the Middle East (see e.g., Greif, 2006; Greif and Tabellini, 2010; 2017; Fukuyama, 2011). By contrast, Western countries have relied on impersonal trust, facilitating the organisation of society through a network of corporations (see e.g., Greif and Tabellini, 2017; De la Croix et al., 2018; Enke, 2019).[3] According to Delhey et al. (2011), Confucianism is negatively correlated with the radius of trust, while the opposite holds true for other religions (e.g., Protestantism). Moscona et al. (2017) and Enke (2019) provide evidence of a negative association between the contemporary radius of trust and pre-industrial kinship tightness. Finally, Schulz et al. (2019) and Henrich (2020) explored how specific policies of the Medieval Roman Catholic Church, such as the prohibition of cousin marriage, which weakened kinship ties, are associated with an increased radius of trust.

Infectious diseases have been the focus of the pioneering works of McNeill (1976, 1980) and Diamond (1997), exploring how they shape the structure of communities and cultural norms from a historical perspective.[4] For instance, McNeill (1976) suggests that initially castes in India were formed as a system of social values and behaviours towards out-

[3] A clan is a social group that traces its lineage back to a common ancestor and typically includes extended families based on kinship ties, while a corporation is a legal entity established by a group of individuals to conduct business and pursue shared interests. Unlike clans, corporations are not founded on blood relations or kinship but on a contractual agreement among individuals (see Greif and Tabellini, 2017; Enke, 2019; Schulz, 2022 for more details on this).

[4] Related to that, a number of studies explore how infectious diseases affected the structure of pre-industrial social networks (see e.g., Cervellati et al., 2019; Enke, 2019).

group and in-group members to avoid exposure to perceived unhealthy or contaminated individuals.[5] These attitudes, initially adopted by ancestors to defend against infectious diseases, were transmitted from one generation to another, and continue to persist, at least to some extent, as cultural traits even nowadays (see e.g., Boyd and Richerson, 1985; 2005), despite the enormous improvements in health standards. This persistence was embodied in the "*parasite-stress theory*" (PST) developed by Thornhill and Fincher (2014), who claim that the historical prevalence of infectious diseases explains contemporary cross-cultural variation. This theory suggests that pre-industrial societies facing pathogen threats developed behavioural adaptations (termed *behavioural immune system*) to avoid potentially unhealthy or contaminated out-groups, while favouring strong localised networks to cope with infections within in-groups. Fogli and Veldkamp (2021) proposed a theoretical model demonstrating that *low-diffusion networks* based on personal relationships were developed as a protective-mode against lethal diseases; however, these networks hindered the diffusion of ideas and technologies. Conversely, in low-pathogen environments, growth-enhancing, *high-diffusion networks* based on impersonal relationships are more viable because of the reduced need for disease protection. Thus, prior scholarly research has indicated that historical infectious disease prevalence leads to a reduced radius of trust, which persists over time through cultural traits that include mistrust towards out-groups and bond-binding norms towards in-group members. Our study empirically tests this hypothesis.

We measure the historical prevalence of infectious diseases at the country level, using the data compiled by Murray and Schaller (2010), who utilized old epidemiological maps to

[5] More precisely, McNeill (1976) notes: *"[….] the taboos on personal contact across caste lines, and the elaborate rules for bodily purification in case of inadvertent infringement of such taboos, suggest the importance fear of disease probably had in defining a safe distance between the various social groups that became the castes of historic Indian society*".

quantify the prevalence of leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, typhus, and tuberculosis. Our index excludes leprosy and tuberculosis, as these can be directly transmitted from one human to another, focusing specifically on diseases that require vectors for transmission (e.g., mosquitos, lice, fleas, and ticks). The endemicity of vector-borne diseases mainly relies on stable geographic and climatological conditions that favour vector and pathogen reproduction (Cervellati et al., 2017). Therefore, to some degree, these diseases can be considered exogenous to human activities. Following the same approach of concentrating on vector-transmitted diseases, we also measure pathogen stress in a subset of ethnic groups from the Standard Cross-Cultural Sample (SCCS), using data compiled by Low (1994).

Our key outcome variables are obtained from survey questions available in the final joint World Values Survey/European Values Survey (WVS/EVS) wave. These questions inquire about the level of trust respondents place in various groups, using the following scale: their family/people they know/their neighbours/people of other religions/people of other nationality/people they meet for the first time. Using these questions, we construct five variables by calculating the social distance between each group outside and within the family (e.g., *people known radius*).[6] This enables us to investigate whether historical pathogen stress affects the contemporary radius of trust as we move from familiar (e.g., neighbours) to unfamiliar groups (e.g., other nationalities). Moreover, following Enke (2019), we examine whether the difference in the level of trust between non-family and family members (*average radius*) is influenced by the historical prevalence of lethal diseases. In addition, we conduct principal component analysis (PCA), which allows us to capture *out-group* and *in-group* trust,

[6] Moscona et al. (2017) conducted a study centered on Sub-Saharan Africa, utilizing data from the Afrobarometer. They developed a similar index, representing the scope of trust, which is calculated as the difference between trust in relatives and trust in nonrelatives.

as well as their difference (*PCA radius*), with a data-driven approach. Finally, we test our hypothesis from a historical perspective using data from the SCCS. In particular, we use Ross' (1983) data on disapproval of violence towards members of the local community, members of the same society, and people of other societies (see, also, Enke, 2019). Taking the local community as the reference point, we construct the variables - *same society violence radius* and *other societies violence radius*. If the radius of trust diminishes in regions with higher pathogen prevalence, as we move towards unfamiliar groups, we anticipate a lower disapproval of violence towards people from other societies.

Our empirical analysis indicates that historical pathogen prevalence is robustly associated with a lower radius of trust towards unfamiliar groups (e.g., people met for the first time), which in turn reduces the *average radius* of trust. This finding is also supported by the effect of historical pathogen prevalence on *out-group* trust, derived from PCA, as well as the difference between the latter and in-group trust (*PCA radius*). These findings are established in three layers: (i) a cross-country analysis that accounts for a large set of confounding factors, such as climatic characteristics and income, and region fixed-effects; (ii) a cross-country individual-level analysis that accounts for the country's geographical and climatic characteristics, as well as individual characteristics, such as income and education; and (iii) a within-country analysis of second-generation migrants that accounts for host country fixed-effects, geographical and climatic characteristics of the country of origin, and migrants' individual characteristics, such as income and education (see Fernández, 2007; Giuliano, 2007). Finally, at the ethnic group level, we find that disapproval of violence decreases in pathogen-prevalent areas, but only when differentiating attitudes between people of other societies and those of the local community - the radius of violence towards people of the same society remains unaffected. Although none of these layers are decisive when considered in isolation, yet taken together, they coherently support our testable hypothesis that pathogen stress reduces the radius of trust.

This study contributes to several branches of existing literature. First, it contributes to recent studies that investigate the determinants of the variation in the radius of trust across countries (see e.g., Delhey et al., 2011; Enke, 2019; Schulz et al., 2019; Enke et al., 2023). Moreover, it is closely related to the literature investigating the global variation in moral universalism, which refers to the extent to which individuals display similar levels of altruism and trust towards strangers and in-group members. This line of research explores the diverse socioeconomic and political outcomes resulting from this cultural trait variation across different societies (Enke, 2020; Enke et al., 2022; 2023), as well as the underlying factors contributing to this variation (Henrich, 2020; Cappelen et al., 2022). To the best of our knowledge, this is the first study to discuss the role of historical pathogen prevalence as a determinant of the radius of trust.

Second, our contribution extends to a strand of literature beyond economics that directly tests the PST with regard to attitudes towards in-groups and out-groups.[7] Van Leeuwen et al. (2012) demonstrated that high pathogen prevalence is positively correlated with ingroup loyalty, in contrast to Hruschka and Henrich's (2013) who showed little to no correlation at the country level between pathogen stress and in-group favouritism. Welzel and Delhey (2015)

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[7] Additional studies have endeavoured to explore the association between pathogen stress and: (i) the strength of family ties and religiosity (Fincher and Thornhill, 2008b; Fincher and Thornhill, 2012); (ii) the cultural dimension of collectivism (Fincher et al., 2008); (iii) the cultural dimensions of extraversion and openness to experience/change (Murray and Shaller, 2010; Thornhill et al., 2010; Fischer, 2021); (iv) the cultural dimension of conformity (Murray et al., 2011); (v) individuals' authoritarian personalities (Murray et al., 2013); (vi) ethnolinguistic fractionalization (Cashdan, 2001; Fincher and Thornhill, 2008a); and (vii) xenophobia (Cashdan and Steele, 2013).

found a negative cross-country correlation between historical pathogen prevalence and out-group trust, whereas Zhang (2018) indicated a curvilinear correlation. As far as our knowledge extends, none of the preceding studies have explicitly examined the influence of infectious diseases on the radius of trust. Instead, these studies have primarily focused on exploring social norms, such as in-group loyalty, which only correlate with the radius of trust but does not directly investigate the effect of infectious diseases on this particular aspect.[8] Furthermore, in contrast to the aforementioned studies, our research aims to rigorously validate the testable hypothesis by providing comprehensive evidence obtained through a multi-layered analysis that includes cross-country, individual, and ethnic group data (see, for example, Ang and Fredriksson, 2017; Ang, 2019).[9]

Finally, our empirical results indirectly associate with the literature on pathogens and economic development. The theoretical hypothesis linking the disease environment to economic productivity and development goes back to McNeill (1976, 1980) and Diamond (1997), and was first empirically tested by Gallup and Sachs (2001) and Sachs and Malanay (2000). More recently, Depetris-Chauvin and Weil (2016) have highlighted the negative impact of malaria on economic development in Africa, Bleakley (2010) established a similar relationship for the Americas, and Cutler et al. (2010), for India. Similarly, Bleakley (2007) and Bleakley and Lange (2009) evaluated the consequences of hookworm disease eradication (circa 1910) on education, health, and long-term economic development in South America.

[8] For instance, Hruschka and Henrich (2013) focus on in-group favouritism proxied though the cultural dimensions of collectivism, nepotism, and the strength of family ties.

[9] Table A1 in the Appendix presents a compilation of studies from various disciplines outside of economics that directly test the PST in the literature. We focus our attention on these studies because they investigate the impact of infectious diseases on outcome variables that are directly (e.g., out-group trust) or indirectly related (e.g., openness to experience) to our own research.

Moreover, Alsan (2015) explored how the climate suitability for tsetse flies within Africa prevented the adoption of domesticated animals and resulted in a lower population density. Finally, Cervellati and Sunde (2011, 2013) investigated the reduced-form effect of health on economic growth over the last half-century. Our study adds to the literature by providing evidence that historical disease burden can influence the radius of trust, acting as an additional channel through which pathogens impact long-term economic development.[10]

The remainder of this paper is organised as follows. Section 2 describes the conceptual framework and relevant literature. Section 3 presents the empirical strategy and describes the data. The results are presented in Section 4. Section 5 concludes the study.

2. Conceptual framework

2.1. Radius of trust: Measurement and policy implications

In the modern world, people regularly engage with familiar and unfamiliar individuals. Francis Fukuyama was among the first scholars who described the radius of trust as the width of the 'circle of people among whom cooperative norms are operative' (Fukuyama, 2001). A wide radius enables productive relationships with socially "remote" individuals, while a narrow radius causes lack of trust outside family and intimate social circles. More recently, Delhey et al. (2011) measured the scope of cooperation using six survey questions devised by Christian Welzel, which were designed to disentangle out-group and in-group trust (see, Welzel 2010). These survey questions ask participants about their level of trust in each of the following six distinct groups: (i) their family; (ii) people they knew; (iii) people in their neighbourhood; (iv) people they met for the first time; (v) people of another religion; and (vi) people of another

[10] In this sense, our empirical findings could also be viewed as an attempt to combine the well-established arguments of *amoral familism* as a cause of economic underdevelopment (see e.g., Banfield, 1958; Putnam, 1993) with new evidence about the influence of pathogens on this culture of in-group favoritism.

nationality. Delhey et al. (2011) calculated the difference between the indices of average out-group and in-group trust (see, also, Enke, 2019). In this context, "out-group" refers to people they meet for the first time, people of another religion, and another nationality, while "in-group" includes the three remaining groups, and an increase in this index implies a wider circle of individuals considered trustworthy. In our study, we adopt a similar approach; however, instead of making ad hoc decisions about group categorisation, we calculate the differences in trust between each group outside, and within the family (used as the reference point). This approach enables us to obtain more information about the perceived gradient of trust with various groups outside the family, ranging from socially close (e.g., neighbours) to socially “remote” individuals (e.g., people met for the first time).

Moral values and social norms have attracted considerable interest in state-of-the-art economics studies. In particular, Enke (2020) and Enke et al. (2023) found that universalists, who demonstrate equal levels of altruism and trust towards strangers and in-group members, are more likely to support policies and candidates that prioritise inclusive and cooperative policies across various domains, including social welfare, economic regulations, environmental protection, and human rights. Andre et al. (2021) shed light on the challenge of combating climate change, which is a global cooperation problem that affects present and future generations worldwide. Their research indicated that individuals who embrace communal and in-group-oriented values are less inclined to actively engage in the fight against climate change, resulting in smaller donations towards this crucial cause. Enke et al. (2022) linked variation in universalism to self-reports of economic and social behaviours, documenting that universalists donate less money locally but more globally, and are less likely to exhibit home bias in equity and educational investments. Finally, Landier and Thesman (2022) provided evidence that individuals who believe that society comes before self, prioritise attitudes of competition and the maximisation of self-interest in the economy. Despite the observed impact of the scope of moral values on diverse socioeconomic and political outcomes, the underlying factors driving their emergence have not yet been thoroughly investigated.

2.2. The role of infectious diseases

The traditional economic approach highlights the importance of reputation in repeated interactions as a major force of trust and cooperation (see e.g., Dixit, 2004).[11] A number of more recent studies have drawn attention to the historical origins of trust and have attempted to explain the large differences observed both, across and within countries, based on history and social anthropology (Tabellini, 2010; Nunn and Wantchekon, 2011; Guiso et al., 2016). A prominent question in this literature is why some societies primarily build trust within family and close relationships, while others establish trust more broadly based on general moral values and societal mechanisms that enforce trust in interactions with people beyond their immediate social circles (see e.g., Greif and Tabellini, 2010; 2017; Moscona et al., 2017; Enke, 2019, Schulz et al., 2019, Henrich, 2020).

According to McNeill (1976, 1980), throughout human history, societies have developed cultural norms and social values that allowed them to defend themselves against infectious diseases, which constituted a major source of morbidity and mortality. More precisely, McNeill (1976) notes: "*Undoubtedly folkways that reduce exposure to diseases were as old as human society, and language and various customs, justified on other grounds, also had important epidemiological consequences - often of a positive kind*". In line with this, Thornhill and Fincher (2014) proposed the "*parasite-stress theory* " (PST), which suggests that human communities developed behavioural adaptations to defend against pathogens (see

[11] Dixit (2004) offers an excellent overview of this literature, explaining that the scope of cooperation is determined by the strength of the incentives one has to preserve their reputation in repeated interactions, relative to the incentive to cheat.

Thornhill and Fincher, 2014). This mechanism, also described as the *behavioural immune system*, includes a set of ancestrally adaptive attitudes, norms towards in-group members, codes of interaction with out-group members, and prejudice against people perceived as contaminated.[12] Because humans evolve resistance to local pathogenic strains, host-defence works more effectively against local pathogens than against those evolving in nearby host groups (see, e.g., Tibayrenc, 2007; Fincher and Thornhill, 2008a). Therefore, in an ecological setting of high pathogen stress, to avoid a novel pathogen, people were more likely to naturally select culturally traits that include xenophobia and mistrust towards outgroups (see, Thornhill and Fincher, 2014). Regarding attitudes towards people who are considered socially close to them, Fincher and Thornhill (2012) suggest that a high pathogen prevalence led people to be more pro-social among in-group members in order to cope with infections. Taken together, we would expect a narrower radius of trust as pathogen prevalence increases.

These attitudes were initially adopted by ancestors to defend against infectious diseases, transmitted from one generation to the next, as behavioural heuristics that simplify decision-making in uncertain and complex environments (see e.g., Boyd and Richerson, 1985; 2005 for more details on this).[13] Based on the rationale for the intergenerational transmission of cultural

[12] To be more precise, human communities developed two main types of adaptation against pathogen stress. The first one is the *classical immune system* that consists of biochemical, cellular and tissue-based adaptation, whereas the second one is the *behavioral immune system,* which is comprised of a set of cultural norms and social values aiming to protect the community from infectious diseases (see e.g., Thornhill and Fincher, 2014).

[13] Following the rationale of a large literature in evolutionary anthropology, Boyd and Richerson (1985) argue that when information acquisition is costly or imperfect, individuals can develop decision-making heuristics or rules-of-thumb. By relying on general beliefs about behavior, individuals may not always act optimally but they save on the costs of obtaining the necessary information. These heuristics often manifest as deeply rooted social values and cultural norms passed down through generations (see Alesina et al., 2013; Buggle and Durante, 2021

traits, it is reasonable to anticipate the persistence of these "deeply rooted" social values and norms to some degree even in contemporary times, despite significant advancements in health standards that have considerably mitigated the impact of past diseases.[14] According to Thornhill and Fincher (2014), the PST accounts for a substantial portion of the observed contemporary cross-cultural variation such as the strength of family ties, religiosity and the cultural dimension of collectivism (see, e.g., Fincher et al., 2008; Murray and Schaller, 2010; Thornhill et al., 2010; Murray et al., 2011; Murray et al., 2013).

Fogli and Veldkamp (2021) formulated a comprehensive theoretical model that associates with the aforementioned rationale. Specifically, the authors examined the association between historical pathogen prevalence, structure of social networks, and contemporary economic growth.[15] The basic conclusion of this model is that, in geographical regions characterised by a lethal disease environment, humans developed *low-diffusion networks* based on a few, local connections as a protective mode, which were detrimental to

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for more details). For a more detailed analysis about the determinants of cultural persistence and the alternative theoretical models that explain both cultural persistence and change, see Nunn and Guiliano (2021).

[14] This raises the issue of reverse causality, suggesting that instead of outsiders introducing diseases to a community and causing the development of norms discouraging interaction with them, it's plausible that these norms were already in place due to cultural or political factors. These pre-existing norms may have rendered the community more vulnerable to diseases brought by outsiders, as they lacked prior exposure or immunity. Consequently, diseases from outsiders could have had a more severe impact on the community, reinforcing the existing norms that discourage contact with outsiders. We address this issue in this study by focusing exclusively on diseases that can be transmitted among humans only through vectors (such as mosquitoes). We provide more details about this in Section 3.2.2.

[15] The authors highlight three key features of social networks: (i) degree, represented by the number of friends an individual has; (ii) individualism, prioritising autonomy, and self-reliance over group interests; and (iii) mobility, resulting when individuals in a society are mobile. These features create *high-diffusion networks* (individualism, high degree, mobility) and *low diffusion networks* (collectivism, low degree, low mobility).

the diffusion of ideas and technology. In contrast, in low-pathogen environments, there was no need for such protection; therefore, *high-diffusion networks* based on impersonal relationships were viable, enhancing technology diffusion, and thereby, a country's rate of growth. Overall, this study highlights the long-term persistence of networks even after the conditions to which they were originally adapted have changed.[16] This enduring cultural pattern, represented by a country's social connections, has led to considerable divergence in technology diffusion and output. Our study is closely related to this framework. Overall, the literature indicates that pathogen prevalence diminishes the societal scope of trust, which is a fundamental cornerstone of development and progress. We aim to investigate this association from a historical perspective and assess its persistence over time, as suggested by the relevant literature.

3. Empirical specification and data

3.1. Regression model

To explore the long-term impact of historical pathogen prevalence on the radius of trust, we estimated OLS regressions of the following form:

$$radius_i = \alpha + \beta pathogen\ stress_i + \gamma X_i + \varepsilon_t \qquad (1)$$

[16] Enke (2019) examined, from a historical perspective, the influence of pathogens on kinship structure using variables from the Ethnographic Atlas (e.g., extended family, joint residence), which collectively measure the degree of closeness between individuals within an extended family network. According to the results, a significant portion of the variation in kinship tightness is driven by ecological conditions and certain disease environments. This aligns with the theoretical prediction of Thornhill and Fincher (2014), which posits that pathogen threat triggers the behavioral immune system, leading to strong in-group connectivity. It is also associated with the findings of Fogli and Veldkamp (2021), as a lethal disease environment incentivizes individuals to form strong localised extended family ties (i.e., *low diffusion networks*).

where *radius* represents the various outcome variables employ to capture the radius of trust, *pathogen stress* is an index of historical pathogen prevalence, *X* includes a large set of control variables, and ε is an unobserved error term. The above empirical specification is estimated using: (i) cross-country; (ii) cross-country individual-level; (iii) ethnic group-level; and (iv) and individual-level data for a sample of second-generation migrants. In layers (i), (ii), and (iii), we include region fixed effects to capture unobserved time-invariant heterogeneity at the region level. We follow the classification of the World Bank, which includes East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Finally, in layer (iv), the analysis across second-generation migrants allows us to include country-of-birth fixed effects.

3.2. Data

3.2.1. Radius of trust

To construct our dependent variable for the layers of empirical analysis (i), (ii), and (iv), we use data from the joint European Values Survey (EVS) and World Values Survey (WVS) wave 7 (2017-2022) that combines two distinct characteristics. First, this joint wave allows us to identify a second-generation migrants' ancestry by either parent's country of birth for the main layer of the empirical analysis (iv).[17] Second, it provides a set of six survey questions that assess the potential to disentangle in-group and out-group trust (see, e.g., Delhey et al., 2011; Welzel and Delhey, 2015). Although these survey questions are also available in waves 5 (2004-2009) and 6 (2010-2014) of the WVS, information about the origin of second-generation migrants is not provided. To this end, we decided to use joint wave 7 for consistency in the

[17] It is important to note that in layers (i) and (ii) of the analysis, when using the joint wave, we retain individuals who were born in the country of the interview, as were their parents. By applying this criterion, we exclude instances of first- and second-generation immigrants from the sample.

analysis between layers (i), (ii), and (iv), whereas we repeat the estimates of layers (i) and (ii) (cross-country and cross-country individual level) using earlier waves 5 and 6, to show that our findings are robust and quantitatively comparable.

Using survey questions asking participants about their trust level towards six distinct groups, we construct five variables by calculating the social distance between the family and each group outside the family – that is, *first time radius*, *another nationality radius*, a*nother religion radius*, *neighbourhood radius*, and *people known radius*.[18] For instance, to calculate *people known radius*, we take the first difference between trust in known people and that in family. In Table A5 included in the Appendix, we observe that the difference in trust between people met for the first time and one's own family is more pronounced compared to the difference in trust between people known and one's family members. This allows us to test whether historical pathogen stress reduces the radius of trust as we move from familiar (e.g., neighbours) to unfamiliar groups (e.g., other nationalities), where social distance seems to increase. We also test whether the average social distance between non-family and family members across countries is affected by the historical prevalence of lethal diseases. Following Enke (2019), we take the difference between average trust in all groups (other than family) and family trust (*average radius*). Figure A1 in the Appendix shows the country-level variation in this variable. In all cases we have negative values, indicating that in all countries in our sample, non-family members are trusted less than family members. At the same time, we observe a significant variation within the limits of the negative values. For instance, Scandinavian countries are among the countries that display the lowest negative values, while some European (e.g., Greece) and South American countries (e.g., Peru) display the highest.

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[18] Original coding from 1 (Trust completely) to 4 (Do not trust at all) was reversed so that a higher value means more trust.

To check the robustness of our results, we also implement principal component analysis (PCA) aiming to identify a smaller set of variables (principal components) that summarize most of the variance of the six survey questions about trust. These principal components are linear combinations of the original variables, explaining the largest amount of variance in the data with the fewest number of principal components. Kaiser (1960) suggested using the number of eigenvalues exceeding one as a criterion. As shown in Table A2 in the Appendix, the first two components explain 67.3 percent of the total variance. Table A2 also maps the loadings of these two components, which represent the correlations between each of the six survey questions and the estimated components. The first principal component that captures 49 percent of the variance correlates higher as we move to socially distant groups (e.g., people met for the first time) and is therefore labelled *out-group* trust. The second principal component, which captures 18 percent of the variance, exhibits a stronger relationship as we move to familiar groups (e.g., family); therefore, it is labelled *in-group* trust. Moreover, as the primary focus of this study lies on the scope of trust, we construct the variable *PCA radius* by calculating the difference between the first and second principal components.

For layer (iii) of the analysis, we use Murdock and White's (1969) Standard Cross-Cultural Sample (SCCS) that consists of 186 nonindustrial, mostly small-scale ethnic groups, observed mainly between 1850 and 1950 (see Divale, 2004). These societies were chosen to be culturally and historically independent, as well as representative of the 1265 societies recorded in the Ethnographic Atlas. Data availability allows us to use information on 79 of these societies, as listed in Table A3 by region and country.[19] Table A4 in the Appendix

[19] As can be seen, our sample spans across all regions of the world, though it should be noted that a significant part is concentrated in Sub-Saharan Africa (20), followed by East Asia and the Pacific (18), Latin America and Caribbean (15), North America (12), South Asia (6), Middle East and North Africa (5), and Europe and Central Asia (3).

summarises the main variables used in the analysis (discussed below) by comparing the means of the societies in our sample with those of the entire sample of 186 societies, revealing no statistically significant differences between the two.

Following Enke (2019), we use Ross' (1983) coding of attitudes in the SCCS regarding the unacceptability (disapproval) of violence to construct three historical proxies for the radius of trust. Ross (1983) coded the unacceptability of violence towards members of the local community (v781), members of the same society (v782), and people in other societies (v783). These variables are coded from 1 (valued) to 4 (disapproved), so that a higher value means that violence is disapproved of by the ethnic group. First, we compute the difference between the disapproval of violence towards people of the same society and people of the local community (*same society violence radius*). Second, we take the difference between the acceptability of violence towards people in other societies and people of the local community (*other societies violence radius*). Using the local community as the reference point, if the radius of trust is lower in pathogen-prevalent areas, we would expect lower disapproval of violence towards people of other societies. Finally, we take the difference between the average disapproval of violence towards people outside the local community and that toward people in the local community (*average violence radius*).

3.2.2. Historical pathogen prevalence

Infectious disease agents are commonly classified into three main categories based on their nature and characteristics: (i) parasitic pathogens; (ii) viral pathogens; and (iii) bacterial pathogens (see, e.g., Smith, et al., 2007). What is relevant for our testable hypothesis, though, is not the infectious agent taxonomy, but the mode of transmission. Along these lines, pathogens can also be classified as: (i) zoonotic; (ii) multi-host; (iii) and human-specific, and each category can be attributed to the three infectious agents. Zoonotic pathogens develop and reproduce entirely in non-human hosts and can infect humans as well (e.g., rabies) but are not transmitted directly between humans. Multi-host pathogens can use both human and non-human hosts (e.g., vectors) to complete their life cycle and primarily spread from human to human indirectly, through specific non-human hosts. A primary example is malaria, which is transmitted by the bite of an infected female *Anopheles* mosquito injecting *plasmodium* parasites into humans.[20] Finally, human-specific pathogens are transmitted only between humans. This classification is of paramount importance because only non-zoonotic pathogens that have the capacity for (direct or indirect) human-to-human transmission have the potential to affect social networks (see, Thornhill and Fincher, 2014; Fogli and Veldkamp, 2021).

In this study, we strictly focus on the prevalence of diseases that can be transmitted among humans only through vectors (such as mosquitoes, lice, fleas, and ticks). This is because the endemicity of these vector-borne diseases primarily depends on the existence of suitable geographic and climatological conditions favourable for the vector and reproduction of the pathogen (see, e.g., Cervellati et al., 2017). This allows us to tackle the issue of reverse causality, where existing cultural norms, rather than human-borne diseases from outsiders, may have originally prompted norms discouraging interaction. These pre-existing norms could have made the community more susceptible to outsider-borne diseases, reinforcing the existing norms against contact with outsiders. We focus on diseases that are exogenous to human activity, whereas human-specific diseases that can spread through droplet infection and faecal-oral transmission are heavily influenced by factors, such as the migration of infected humans, the volume of economic activity, and inter-regional trade.

[20] While there are several multi-host diseases caused by parasites, it is important to note that multi-host diseases can also be caused by viral and bacterial pathogens. For instance, dengue fever is caused by the dengue virus when a person is bitten by a female *Aedes* mosquito, whereas typhus is a bacterial disease transmitted through the bites of body lice or fleas that are infected with the bacterium.

We obtain our data from Murray and Schaller (2010), who complemented earlier work by Fincher et al. (2008) to create a historical pathogen prevalence index, aiming to include the widest possible sample of countries. Indeed, the resulting index coverage significantly surpasses previous attempts (see also Gangestad and Buss, 1993), making it an appealing choice for studies focusing on broad cross-country estimations (see, e.g., Murray et al., 2013; Ang and Fredriksson, 2017; Gorodnichenko and Roland, 2017; Nikolaev et al., 2017; Dalgaard et al., 2021; Fogli and Veldkamp, 2021). The authors coded the historical prevalence of nine non-zoonotic diseases, associated with a significant risk of death: leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, typhus, leprosy, and tuberculosis.[21] To assess the prevalence of each disease, a 4-point scheme was utilized: 0 = completely absent or never reported; 1 = rarely reported; 2 = sporadically or moderately reported; and 3 = present at severe or epidemic levels at least once. Following the logic of focusing on vector-borne diseases, we exclude leprosy and tuberculosis, which can be transmitted directly from human to human. Information on the remaining seven pathogens was gathered exclusively from old epidemiological maps (e.g., Simmons et al., 1945) and originally collected by the Medical Intelligence Division of the United States Army around the 1930s.[22] To ensure comparability across diseases, Murray and Schaller (2010) converted the prevalence of each disease into z-

[21] It should be noted that the nine coded diseases are caused by all three types of pathogens according to the infectious agents' taxonomy. Leishmaniasis, trypanosomes, malaria, schistosomes, and filariae are caused by parasitic pathogens, dengue is caused by a viral pathogen, and typhus, leprosy, and tuberculosis are caused by bacterial pathogens. This information is sourced from the World Health Organization.

[22] The prevalence of tuberculosis was constructed from a different and more recent source (National Geographic Society's 2005 Atlas of the World), whereas the prevalence of leprosy was informed by verbal summaries found in Simmons et al. (1945) because of insufficiently detailed historical maps (see, Murray and Shaller, 2010). In general, worldwide historical data on the prevalence of human specific diseases are scarcer.

scores.[23] The resulting overall pathogen prevalence index is estimated as the average of seven individual disease z-scores (*pathogen stress*). The mean index is close to zero, with positive (negative) values suggesting that the average pathogen score is higher (lower) than the mean. This is our main independent variable for layers of empirical analysis (i), (ii), and (iv). Figure A2 shows the country-level variation in *pathogen stress*. In line with expectations, Figure 1 reveals a strong negative correlation (-0.55, $p < 0.01$) between *pathogen stress* and the *average radius*.

[Insert Figure 1 here]

Because the transmission of vector-borne diseases is more prevalent in tropical and subtropical areas, one could argue that the seven pathogens that comprise our index (i.e., leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus) capture the effect of ecological conditions that include, but are not limited to, disease pathogens. To mitigate this concern, we include in our estimates a rich set of climatic and geographic controls (e.g., absolute latitude) that includes the variable *tropical*, measured as the percentage of land within countries exposed to tropical and subtropical climates. In addition, throughout the analysis, we test the validity of our findings by excluding countries with this characteristic from

[23] Unfortunately, we lack detailed information about how the disease values for each country were derived by their source. It remains unclear whether Murray and Shaller (2010) based these values on factors such as the maximum disease burden within a country's borders or if they employed some form of averaging, possibly considering territory or population as weights. This is a critical concern, particularly for large countries like China and India, which encompass a wide range of climates and presumably have diverse historical disease environments. To partly offset this concern, in our robustness checks, we exclude the longest countries from the sample. Nevertheless, it's essential to recognize that disease burden heterogeneity within countries is influenced by various geographical and environmental factors (such as altitude and rainfall), and longitude is just one of them.

the sample. When performing this test, although as expected the average score of *pathogen stress* decreases from -0.069 to -0.29, we still observe significant variability across countries and within regions, driven mainly by the prevalence of leishmanias, malaria, dengue, and typhus. Moreover, we continue to account for the confounding effect of ecological conditions, including in our set of controls absolute latitude, mean precipitation per annum, and temperature volatility.

For layer (iii) of the analysis, we use Low's (1994) pathogen codes from the SCCS (v1253-v1259). Using historical sources, Low (1994) made coding specific to the local conditions of an ethnic group; that is, pathogen prevalence could potentially differ between societies within the same country. This is essential for the analysis, given that many ethnic groups occupy only a small portion of the country's territory. In addition, when pathogen data existed from more than a single time period, Low (1994) employed those from the period closest to that of the ethnography. Historical epidemiological data are available from the 1930s (or slightly later). Therefore, even the earliest date of observation can deviate significantly from the date of the ethnography in some cases. To mitigate this concern, we check the robustness of our results by keeping in our sample ethnic groups that are observed after the second hand of the nineteenth century and prior to 1940.

Low's (1994) data include information on seven diseases: (i) six that overlap with the data of Murray and Schaller (2010), namely leishmanias, trypanosomes, malaria, schistosomes, filariae, and leprosy; and (ii) spirochetes that cause non-zoonotic diseases, such as Lyme disease. Following the same logic of focusing on vector-transmitted diseases, leprosy is excluded from the analysis. Low (1994) employed a 3-point coding scheme: 1 = absent or not recorded; 2 = present, no indication of severity; and 3 = present and serious, widespread, or endemic. Given that for value two the severity is unclear, we decided to assign the value of one if a disease was present (or recorded) and zero, otherwise. The overall pathogen index is estimated as the average of six dummy variables (*SCCS pathogens*).[24] It takes values from zero to one, with higher values indicating that more coded pathogens were present within the territory of the ethnic group. Although this definition allows us to explore pathogen exposure at the extensive margin, thus not informative about the severity of pathogen exposure, it is subject to a much lower measurement error. Tables A5-A8 in the Appendix provide descriptions, data sources, and descriptive statistics for the main variables included in the four layers of the empirical analysis.

4. Results

4.1. Cross-country analysis

Table 1 examines the relationship between *pathogen stress* and our main measures of the radius of trust - that is the five between-bracket differences (such as the *first time radius*) and the *average radius*- using country-level data. All estimates include region fixed-effects, whereas the even-numbered specifications are augmented with a rich set of controls. In particular, we control for the effects of absolute latitude, precipitation, temperature volatility, tropical (and subtropical climate), elevation, island and landlocked regions, distance to waterways, terrain ruggedness, land quality, and years since the onset of the Neolithic Revolution (see, e.g., Galor and Özak, 2016; Ang and Fredriksson, 2017; Ang, 2019; Buggle, 2020). Given that we focus on vector-transmitted diseases, controlling for tropical and subtropical climate, as well as absolute latitude, precipitation, and temperature volatility, is essential to mitigate concerns that we are picking up the effect of tropical areas. Moreover, to account for institutional effects, we control for legal and colonial origins (see e.g., La Porta et al., 1999; Acemoglu et al., 2002). Finally, the relationship between *pathogen stress* and the radius of trust can be associated with

[24] Additional information of the vector borne diseases that comprise our two indices, *pathogen stress* and *SCCS pathogens* are provided in Appendix B.

the level of development and some religious traits and constraints. To this end, the remaining controls include contemporary GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). For direct comparability, coefficient estimates of *pathogen stress* throughout the analysis are standardised for the respective estimation sample.

As shown in Table 1, the coefficient on pathogen stress is consistently negative and statistically significant between 5 and 10 percent levels of significance when associated with the radius of trust of socially distant groups, namely, the *first-time radius*, and *another religion radius*. In contrast, *pathogen stress* loses its statistical significance in columns (4) and (8), which reports estimates for the full model specification of *another nationality radius* and *neighbourhood radius*. Regarding the latter, given that repeated interactions with neighbours can cultivate familiarity and trust, it is not surprising that *the neighbourhood radius* is not affected by historical pathogen prevalence. However, this is not the case in columns (9) and (10), where the coefficient on *pathogen stress* is negative and statistically significant when related to the radius of trust towards the most familiar group of the six, namely, people known personally. Moreover, in columns (11) and (12), we obtain a negative and statistically significant coefficient when the *average radius* is regressed against *the pathogen stress*. Regarding the magnitude of the effect, the specification in column (12) implies that a one standard deviation increase in *pathogen stress* (0.59) is associated with a 0.53 standard deviation decrease in the *average radius* of trust. With an unconditional mean of -1.24, this corresponds to a decrease of approximately 43 percent.

[Insert Table 1 here]

Our next exercise is to replace our main dependent variables with the first and second principal components of the six survey questions: *out-group* and *in-group* trust, as well as their difference (*PCA radius*). The results are reported in Table A9 of the Appendix. As can be seen, the coefficient of *pathogen stress* in columns (1) and (2) is negative and statistically significant when associated with *out-group* trust. Next, in columns (3) and (4), we obtain the expected positive sign when *in-group* trust is regressed against *pathogen stress* although the estimated coefficient is statistically insignificant. These results generate a negative and statistically significant association between historical pathogen prevalence and *the PCA radius* in columns (5) and (6). Therefore, in line with expectations, as *pathogen stress* increases, the radius of people who are deemed trustworthy decreases.

We continue by testing the robustness of our initial findings as shown in Table 1. First, in Table A10 in the Appendix, we control for additional channels through which *pathogen stress* can be associated with the radius of trust. In particular, we account for the long shadow of state antiquity and pre-industrial kinship, followed by controlling for contemporary measures of institutions, ethnic fractionalisation, and individualism. The *state antiquity index* of the cumulative presence of state institutions from 1 AD to 1500 AD (see, Putterman, 2010) controls for the possibility that early institutions can be correlated with both, *pathogen stress* and the radius of trust. Moreover, according to Enke (2019), pre-industrial *kinship* tightness is a strong predictor of the contemporary radius of trust. In addition, using data obtained from Marshall and Jaggers (2010), Desmet et al. (2012), and Pelham et al. (2022), we control for contemporary institutions, ethnic fractionalisation, and individualism. The latter allows us to exclude the possibility that we capture the relationship identified in previous studies between pathogen prevalence and individualistic values (see, e.g., Gorodnichenko and Roland, 2017; Kammas et al., 2017; Nikolaev et al., 2017). Furthermore, epidemiological conditions have been shown to affect the origin and persistence of ethnic diversity (see, Cashdan, 2001; Cervellati et al., 2019). Finally, we control for contemporary institutions to exclude the possibility of capturing the effect of institutional quality on the radius of trust.

Second, in Table A11, we add to the set of covariates, a measure of *contemporary pathogen stress*, as developed by Fincher et al. (2008). This index was constructed explicitly from epidemiological information from the Global Infectious Diseases and Epidemiology Online Network (GIDEON), which reports the current distribution of infectious diseases worldwide. The authors focused on seven classes of pathogens (leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy) that overlap with our historical measure. Odd-numbered columns report specifications where (historical) *pathogen stress* is replaced with *contemporary pathogen stress*, whereas even-numbered specifications report horserace regressions with both measures of pathogen prevalence. While contemporary pathogen stress and the historical prevalence of infectious diseases exhibit a high correlation (see, e.g., Fogli and Veldkamp, 2021), our study's findings remain unaffected. One possible explanation is that antipathogen tendencies may not solely arise from responses to current circumstances but could also be influenced by adaptive challenges faced by our ancestors (see, e.g., Boyd and Richerson, 1985; 2005).

Third, in Tables A12 and A13, we experiment by dropping countries with specific characteristics, from our estimates. In Table A12, we drop countries with tropical and subtropical climates from the sample to check whether ecological conditions that include but are not limited to disease pathogens drive our results. Although we control for climatic and geographical controls throughout the analysis, this test can mitigate further concerns that we are not picking up the effect of tropical locations. Moreover, in Table A13, we check whether our results are driven by the inclusion of some long countries that include a wide variety of climates and, presumably, many different historical disease environments (see, Ang and Fredriksson, 2017). To this end, we exclude countries that fall within the 10 longest countries of the world from our sample: Argentina, Australia, Brazil, Canada, Chile, China, India, Norway, Russia, and the U.S. Of course, longitude is by no means the only factor that contributes to environmental heterogeneity and there are several geographical and environmental factors (such as altitude and rainfall) that may also influence the disease burden heterogeneity within country. However, most of these countries also exhibit significant variations in an east-west direction, leading to regional differences in factors like altitude and rainfall. By excluding these countries from the analysis, partly helps to address the heterogeneity issue as it pertains to matters other than longitude.

Fourth, in Table A14, we merge waves 5 (2005-2009) and 6 (2010-2014) of the WVS, in which the six survey questions of trust are available. This allows us to have a sample of 63 countries that overlap 80 percent with our sample in the full specifications of Table 1, and check if the results are comparable. As can be seen in columns (1)-(6), our results indicate a negative and statistically significant association between *pathogen stress* and trust towards more distant groups. In summary, the five tests reveal a robust negative association between *pathogen stress* and radius of trust in two socially distant groups: people met for the first time and people of another religion. These two groups predominantly contribute to the strong negative effect of *pathogen stress* on the *average radius*.

4.2. Individual-level analysis

This section uses the joint wave to provide additional evidence on the effect of country-level *pathogen stress* on individuals' radius of trust. Disaggregated individual data allow to account for individual characteristics, such as age and gender. Specifically, the set of individual controls include age, age-squared, marital status, and sex. In addition, country-level GDP per capita, average years of schooling, and percentages of a major religion (Muslims, Protestants, and Catholics) are not included because their effects are captured at the individual level (see, e.g., Ang and Fredriksson, 2017). In particular, GDP per capita is replaced with dummy variables for income levels (low, middle, and high). Also, the average years of schooling variable was replaced with educational attainment dummy variables (lower, middle, and upper), whereas religiosity is replaced with dummy variables for religious denomination (Muslim, Protestant, or Catholic). Furthermore, the second layer of the empirical analysis includes climatic and geographical characteristics (e.g., absolute latitude and tropical conditions), along with the timing of the transition to the Neolithic Revolution, as employed in the cross-country analysis. The same holds for the legal origins and colonial dummies. We also control for region fixed effects, whereas standard errors are corrected for clustering at the level of the country where the interview was conducted. The results presented in Table 2 follow a structure similar to Table 1. The coefficient of *pathogen stress* shows a statistically significant negative association with all radii of trust components except the *neighbourhood radius*. Additionally, it exhibits a negative correlation with the *average radius*.

[Insert Table 2 here]

Moreover, in Table A15 in the Appendix, we replace our main dependent variables with the first two principal components of trust and their first difference. In accordance with expectations, *pathogen stress* is negatively (positively) associated with *out-group* (*in-group*) trust, which in turn generates a negative effect on *PCA radius.* Next, in Tables A16-A20 we perform the five robustness checks of the previous section (e.g., additional controls) on our findings in Table 2. Obtained results are in line with the evidence obtained in the cross-country analysis. More specifically, *pathogen stress* has a strong negative association with the radius of trust towards two distant groups: people one meets for the first time and people of another religion.[25]

[25] The only exception is in Table A20, where we use WVS waves 5 and 6. In this case, the coefficient of *pathogen stress* becomes marginally insignificant when associated with *another religion radius*, that in turn affects the specification that *average radius* is the dependent variable. Furthermore, in Table A17, we observe that when *contemporary pathogen stress* is included in the empirical model, both on its own and in conjunction with

4.3. SCCS analysis

Our next step is to assess, from a historical perspective, whether pathogen prevalence influences the radius of violence, using Murdock and White's (1969) SCCS. To this end, we replace *pathogen stress* with *SCCS pathogens,* as defined in Section 3.2.2. Moreover, as already mentioned, we proxy for trust, using data containing information on the unacceptability of violence (see, e.g., Enke, 2019). Following the same logic as above, we use as dependent variables, *other societies violence radius, same society violence radius*, and *average violence radius*. In addition, following the analysis so far, odd-numbered columns include region fixed effects, whereas even-numbered columns augment the empirical specifications with climatic and geographical controls (absolute latitude, precipitation, tropical, elevation, distance to coast, ruggedness, and land quality) (see, e.g., Fenske, 2013; Galor and Özak, 2016). We also proxy for development at the ethnic group level, using the ordered variable of population density. Finally, following Enke (2019), we control for kinship tightness, which appears to have a strong negative association with the radius of trust.

The estimates using the SCCS are presented in Table 3. As shown in columns (1) and (2), the coefficient on *SCCS pathogens* is negative and statistically significant at the 10 percent level when associated with disapproval of violence that distinguishes members of other societies and those of the local community. In contrast, in columns (3) and (4), where the radius considers members of the same society, the effect of *SCCS pathogens* becomes statistically insignificant. Therefore, in line with our expectations, violence disapproval decreases as we move from the local community to more distant groups that are not deemed trustworthy. Finally, in columns (5) and (6), we obtain the expected negative sign when *average violence*

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historical pathogen prevalence, there appears to be a positive correlation with certain measures of the radius of trust. However, the impact of the historical variable remains unaffected and persists.

radius is regressed against *SCCS pathogens*, although the estimated coefficient is statistically insignificant.

[Insert Table 3 here]

In Tables A21-A24, we perform four robustness checks to validate and strengthen our findings. In Table A21, we exclude observations that, according to Ross (1983), are of weak quality. Moreover, in Table A22, we exclude observations with Cook's distance above a common rule-of-thumb threshold (four divided by the number of observations). Furthermore, in Table A23, we replace the heteroskedasticity-robust standard errors with standard errors clustered at the language subfamily level. Finally, in Table A24, we exclude ethnic groups observed before 1850 or after 1940 to minimise the deviation between the (historical) epidemiological data and the year in which ethnic group characteristics were observed, while ensuring a sufficient number of observations. Overall, the results presented in Table 3 remain intact.[26] Specifically, *SCCS pathogens* is robustly and negatively associated with *other societies violence radius*.

4.4. Second-generation migrant analysis

In the final layer of our empirical analysis, we apply an epidemiological approach to study the parental transmission of culture to children (see Fernández, 2007; Giuliano, 2007). In particular, our goal is to examine the extent to which cultural parameters embedded in historical *pathogen stress* in the country of origin are affecting the current levels of the radius of trust of second-generation migrants. This approach accounts for time-invariant unobserved

[26] We refrain from excluding ethnic groups located in tropical and subtropical regions, as doing so would result in only 13 observations. Instead, we rerun the regressions from Table 3 using ethnic groups with less than 20 percent exposure to tropical and subtropical climates, which provides a sufficient number of observations; we find that our results remain consistent.

heterogeneity in the host country (e.g., geographical and institutional characteristics). Moreover, as *pathogen stress* in the parental country of origin is distinct from the historical pathogen prevalence in the country of residence, the estimated effect in the country of origin captures the culturally embodied, intergenerationally transmitted effect of *pathogen stress*. The sample of second-generation migrants comprises survey participants who were born in the country where the interview was conducted, whereas either one, or both of their parents, were born in a different country.[27] Table A25 summarises second-generation migration flows by country of residence. In particular, we have information on 4628 individuals who reside in the 67 countries where the interviews were conducted.[28] For instance, in Austria, we observe 101 second-generation migrants originating from 24 different countries, predominantly from Germany. Moreover, we observe substantial diversity: 61 out of 67 countries in the sample have second-generation migrants from at least three different countries of origin, whereas 50 percent of the sample has at least six, with the U.S being the most diverse country in the sample, with 43 groups. Table A26 summarises second-generation migration flows by country of origin. As can be observed, these 4628 individuals come from 103 countries of origin. For instance, 49 second-generation migrants in the sample originate from Algeria, but currently reside in four different countries, with France being the most prevalent. We also observe that close to 30 percent of our observations are from individuals with origins in China, Germany, and Russia. To this end, we perform a robustness check to examine whether these three groups of second-generation migrants drive the results.

[27] In cases where only one parent is a migrant, we link the radius of trust of the second-generation migrant to the pathogen stress of the country of origin of that parent. In instances where both parents are migrants, we calculate the average value of pathogen stress from the country or countries of their origin.

[28] This is the total sample of second-generation migrants that we obtain from the full (even-numbered) specifications of Table 4.

Table 4 presents the estimated impact of historical pathogen prevalence in the country of origin on the current radius of trust among second-generation migrants. Odd-numbered columns report specifications with country-of-residence fixed effects, whereas even-numbered specifications control in addition for individual characteristics (e.g., age) and country-level characteristics (e.g., absolute latitude) of the country of ancestry of the individual. In all estimates, heteroscedasticity-robust standard errors are clustered at the parent's country of origin. As can be seen, the coefficient on *pathogen stress* is negative and statistically significant at the 5 percent level of significance in columns (2) and (4), which report its relationship with *the first time radius* and *another nationality radius* accounting for the full set of controls. In contrast, the effect of historical pathogen prevalence loses its statistical significance when associated with *another religion radius* in columns (5) and (6). Moreover, regarding the effect of *pathogen stress* on the radius of trust towards familiar groups in columns (7)–(10), namely, people from the neighbourhood and people known personally, only *the neighbourhood radius* is affected. Finally, in columns (11) and (12), the historical pathogen prevalence has a robust negative association with the *average radius* of trust.

[Insert Table 4 here]

Next, in Table A27, we rerun estimates using the three variables derived from the PCA: *out-group*, *in-group*, and *PCA radius*. In line with the findings from the first two layers of the empirical analysis, the coefficient on *pathogen stress* remains negative and statistically significant, when examining its association with *out-group* trust and *the PCA radius*. Furthermore, in Tables A28-A31 we perform the first four robustness checks of layers (i) and (ii) (e.g., additional controls). Also, in Table A32, we exclude the three most prevalent groups of second-generation migrants in our sample–China, Germany, and Russia–from the full specifications estimated in Table 4.[29] Overall, these five tests indicate a robust negative effect of *pathogen stress* on the radius of trust towards the more distant groups; specifically, people one meets for the first time and people of another nationality. These two main groups drive the robust negative effect of *pathogen stress* on *average radius*.[30]

In summary, as expected based on prior theoretical predictions, our findings across layers (i), (ii), and (iv) reveal a robust negative association between *pathogen stress* and the radius of trust towards socially distant groups. This robust finding remains unaffected even when we conduct the demanding test of excluding countries (or countries of origin) with tropical and subtropical climates, addressing potential concerns related to ecological conditions. Evidence related to this robustness check in Tables A12, A18, and A30 indicates that historical pathogen prevalence exclusively influences the radius of trust towards more distant groups. However, it should be noted that our findings in layers (i) and (ii) indicate a robust negative association of historical pathogen prevalence with *first time radius* and *another religion radius*, while in layer (iv), the effect on the latter is replaced with the effect on *another nationality radius*. These findings are also supported by the effect of historical pathogen prevalence on *out-group* trust derived from principal component analysis, as well as the difference between the latter and *in-group* trust. This is also the case when we proxy for the radius of trust using historical data on disapproval of violence in layer (iii). We observe that

[29] It is worth noting that we also test if our results are affected by groups of second-generation migrants with less than 10 observations. Once again, our results (available upon request) remain unaffected.

[30] In Table A29, where *contemporary pathogen stress* in the country of origin is included in the empirical specification alongside historical pathogen prevalence, we observe a negative and statistically significant relationship between the former and *neighbourhood radius*. However, it is important to highlight two points: (i) this is the only specification in our analysis where we find a negative effect of *contemporary pathogen prevalence*; (ii) the latter does not seem to affect the statistical significance of historical pathogen prevalence.

disapproval of violence decreases in pathogen-prevalent areas when we differentiate attitudes between people of other societies and those of the local community. In contrast, the radius of violence towards people of the same society is unaffected.

5. Conclusions

Do people believe that it is morally right to treat everyone equally, or do they believe in having specific obligations towards socially close individuals, such as family and friends? In recent years, economic studies have delved into the concept of the scope of moral boundaries, as the latter significantly influences economic and policy decisions (see e.g., Tabellini, 2008; Enke, 2019; Schulz et al., 2019; Cappelen et al., 2022). For instance, choices related to redistribution, immigration, and climate protection policies entail complex trade-offs between in-group members and outsiders, making the scope of people's moral boundaries a pivotal factor in shaping these outcomes.

A key aspect that reflects the scope of moral values is the concept of the radius of trust. This measure captures the extent to which trust is restricted towards a narrow circle of familiar people, or, in contrast, involves a wider circle of outsiders, enabling productive relationships with socially "remote" individuals. Drawing on the conceptual framework proposed by McNeill (1974) and Thornhill and Fincher (2014), which was subsequently formalised by Fogli and Veldkamp (2021), we posit that countries with a historical prevalence of lethal diseases experienced behavioural adaptations that endured across generations. These adaptations aimed to minimise contact with potentially unhealthy or contaminated out-groups while emphasising strong local networks to manage infections effectively, resulting in a lower radius of trust.

Our empirical findings establish a robust negative association between historical pathogen prevalence and the contemporary scope of trust, driven by the difference in the level of trust between more distant groups (e.g., people met for the first time) and family members.

Furthermore, this pattern remains consistent when we use historical data on disapproval of violence at the ethnic group level as a proxy for trust. Specifically, our estimates demonstrate a decrease in disapproval of violence as we transition from the local community to more distant societies that are not deemed trustworthy. Overall, the evidence presented in this study underscores the significance of historical pathogen prevalence in explaining a fundamental cultural trait that endures over time, even among second-generation migrants who are no longer exposed to such threats.

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Table 1. Pathogen stress and the radius of trust: cross-country analysis

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress	-0.668***	-0.608***	-0.531***	-0.313	-0.565***	-0.530**	-0.484***	-0.295	-0.651***	-0.571*	-0.655***	-0.532***
	(-4.063)	(-3.500)	(-3.490)	(-1.630)	(-3.258)	(-2.404)	(-3.435)	(-1.132)	(-5.398)	(-1.945)	(-4.183)	(-3.363)
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓		✓		✓
R2	0.326	0.896	0.407	0.875	0.290	0.838	0.321	0.872	0.421	0.837	0.365	0.907
Observations	76	59	76	59	76	59	76	59	76	59	76	59

Notes: The unit of observation is the country. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five country-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table 2. Pathogen stress and the radius of trust: individual-level analysis

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress	-0.228***	-0.158***	-0.199***	-0.084*	-0.196***	-0.155***	-0.122***	-0.040	-0.224***	-0.126**	-0.250***	-0.148***
	(-4.071)	(-3.872)	(-3.634)	(-1.701)	(-3.555)	(-3.505)	(-3.153)	(-0.821)	(-5.198)	(-2.325)	(-4.318)	(-3.113)
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓		✓		✓
R2	0.038	0.102	0.066	0.132	0.038	0.100	0.022	0.070	0.049	0.101	0.058	0.135
Observations	103203	88267	99240	85206	99152	85170	104107	88995	104487	89260	96535	83002

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, Spanish, Portugal, and other European), a set of European colony dummies (British, French, Spanish, and Portugal). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table 3. Pathogen stress and disapproval of violence: SCCS analysis

Dep. variable:	*other societies violence radius*		*same society violence radius*		*average violence radius*	
	(1)	(2)	(3)	(4)	(5)	(6)
SCCS pathogens	-0.511**	-0.630*	-0.127	-0.131	-0.394*	-0.570
	(-2.345)	(-1.796)	(-0.795)	(-0.408)	(-1.894)	(-1.574)
Region FE	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓
R2	0.150	0.284	0.106	0.216	0.084	0.172
Observations	63	61	77	75	61	59

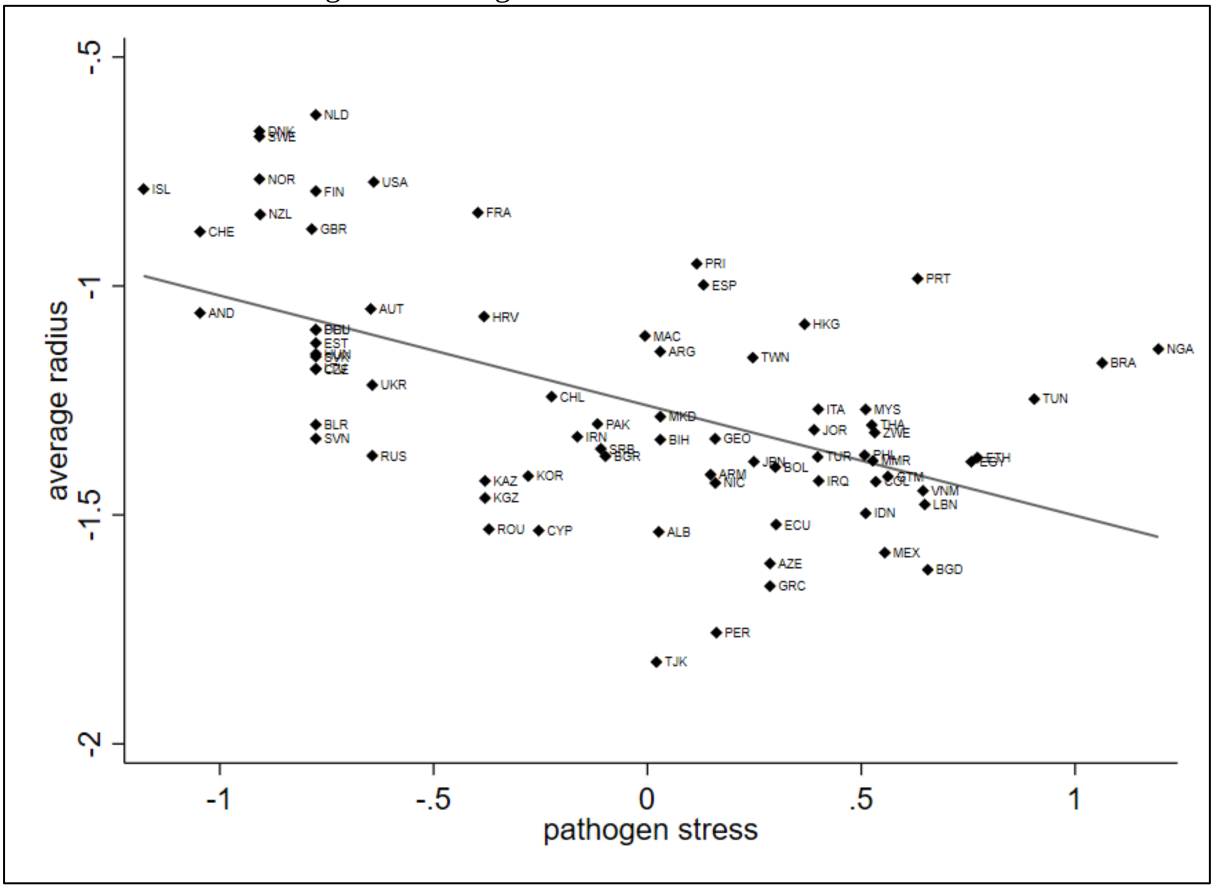
Notes: The unit of analysis is the ethnic group from the Standard Cross-Cultural Sample. Column titles refer to the dependent variable. In columns (1)-(2), using Ross' (1983) data we calculate the difference between the acceptability of violence towards people in other societies and the local community. In columns (3)-(4), we compute the difference between the disapproval of violence towards people of the same society and the local community. In columns (5)-(6), we find the difference between the average disapproval of violence towards people outside the local community and those within it. SCCS pathogens, constructed using data from Low (1994), measures the historical presence of infectious diseases at the ethnicity level including leishmanias, trypanosomes, malaria, shistosomes, filariae, and spirochetes. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, tropical, elevation, distance to coast, ruggedness, land quality, area, population density, and kinship tightness. The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table 4. Pathogen stress and the radius of trust: Second-generation migrants' analysis

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress	-0.132***	-0.093**	-0.025	-0.088**	-0.016	-0.048	-0.122***	-0.108**	-0.083***	-0.040	-0.089***	-0.079**
	(-4.830)	(-2.207)	(-1.007)	(-2.144)	(-0.560)	(-1.087)	(-4.692)	(-2.289)	(-4.064)	(-0.886)	(-3.566)	(-2.055)
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓		✓		✓
R2	0.116	0.136	0.143	0.163	0.128	0.142	0.058	0.087	0.099	0.106	0.139	0.157
Observations	5274	4562	5033	4365	5000	4335	5296	4572	5337	4607	4863	4225

Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Figure 1. Pathogen stress and the radius of trust



Notes: Scatter plot relationship between the average radius of trust (EVS and WVS, 2017-2022) and pathogen stress (Murray and Schaller, 2010).

Appendix

Historical pathogen prevalence and the radius of trust

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Appendix A. Additional Tables and Figures

Table A1. Prior evidence outside of economics that test the Parasite stress theory

Study	Pathogen variable	Association with	Sample	Method	Basic findings
Cashdan (2001)	Low (1994) historical pathogen prevalence index at the ethnic group level	Ethnic diversity—number of ethnic groups in the region of each of the 186 SCCS societies	82 SCCS societies	Spearman's correlations (accompanied by p-values) between ethnic diversity and pathogen prevalence	Positive correlation between pathogen stress and ethnic diversity
Cashdan and Steele (2013)	Cashdan and Steele (2013) historical pathogen prevalence index at the ethnic group level	SCCS measures of collectivist values, in-group bias, residential mobility, and contact with other groups	60 to 186 SCCS societies	Spearman's correlations (accompanied by p-values) between group bias/collectivism and pathogen prevalence	SCCS societies in high pathogen areas were more likely to socialize children toward collectivist values. There was some evidence that pathogens were associated with reduced adult dispersal
Fincher et al., (2008)	Contemporary and historical pathogen prevalence indices generated by the authors	Alternative measures of Individualism/Collectivism	52 to 70 country level observations	Correlations (accompanied by p-values) between individualism/collectivism indices and pathogen prevalence	Stronger positive (negative) correlation between historical pathogen prevalence and collectivism (individualism)
Fincher and Thornhill (2008a)	Contemporary pathogen richness and, contemporary pathogen prevalence index generated by the authors	Indigenous Language Richness (Number of indigenous languages(ln))	221 country level observations	Zero-order correlations between indigenous language richness and diseases richness	Positive correlation between pathogen stress and indigenous Language Richness
Fincher and Thornhill (2008b)	Contemporary pathogen richness and, contemporary pathogen prevalence index generated by the authors	Total number of religions per country/territory	214 country level observations	Zero-order correlations between religion richness and diseases richness/pathogen prevalence	Positive correlation between pathogen stress and religion diversity
Fincher and Thornhill (2012)	Contemporary pathogen prevalence index generated by the authors	In group assortative sociality composed as a synthetic measure of family strength and religiosity	65 country level observations; and US state level observations	Correlations (accompanied by p-values) between in-group assortative sociality and pathogen prevalence	Positive correlation between pathogen stress and in-group assortative sociality
Fischer (2021)	Murray and Schaller (2010) historical prevalence of infectious diseases	Composite measures of openness to change and self-transcendence constructed from the 10-item value inventory which was inspired by the Portrait Value Survey	Cross-Country Individual Level Analysis for samples that between 56-60 countries	Mixed-effect models that relate openness to change and self-transcendence and pathogen prevalence	Pathogen stress was not a significant predictor of openness to change and self-transcendence
Hruschka and Henrich (2013)	Fincher and Thornhill (2012) contemporary prevalence of infectious diseases	Alternative measures of in-groups preferences (e.g., strength of family ties)	71 to 121 country level observations	OLS regressions that relate in-group preferences and pathogen prevalence	Pathogen stress shows inconsistent associations with in-group favoritism
Murray et al., (2011)	Murray and Schaller (2010) historical prevalence of infectious diseases	Alternative measures of conformity pressure (e.g., conformity to majority opinion)	17 to 83 country level observations	Zero-order correlations between measures of conformity pressure and historical pathogen prevalence	Positive correlation between historical pathogen prevalence and conformity

Murray et al., (2013)	• Murray and Schaller (2010) historical prevalence of infectious diseases • Cashdan and Steele (2013); and Low (1994) historical pathogen prevalence at the ethnic group level	• Individual Authoritarianism: differences in traits and attitudes that define the authoritarian personality (e.g., conventionalism, authoritarian submission, authoritarian aggression, ethnocentrism) • SCCS composite measure of authoritarianism that includes among others leadership selection basis and perceptions of leader's power	31 country level observations; 90 SCCS societies	Correlations (accompanied by p-values) between authoritarian governance and historical pathogen prevalence	Positive correlation between historical pathogen prevalence and authoritarianism
Murray and Schaller (2010)	Murray and Schaller (2010) historical prevalence of infectious diseases	• Alternative measures of Individualism/Collectivism • Extraversion • Openness to experience • Female socio-sexuality • Use of spices in food preparation • Restriction of rights and civil liberties • Democratization	34 to 192 country level observations	Correlations (accompanied by p-values) between different cultural dimensions and historical pathogen prevalence	• Positive (negative) correlation between historical pathogen prevalence and collectivism (individualism) • Negative correlation between historical pathogen prevalence and extraversion/openness to experience • Negative correlation between historical pathogen prevalence and female socio-sexuality • Positive correlation between historical pathogen prevalence and use of spices in food preparation • Positive correlation between historical pathogen prevalence and restriction of rights and civil liberties • Negative correlation between historical pathogen prevalence democratization
Thornhill et al., (2010)	• Three contemporary indices of pathogen richness (zoonotic, multi-host, human specific) for 227 countries generated by the authors	• Alternative measures of Personality Traits (e.g., female sociosexual orientation) • Alternative measures of Individualism/Collectivism • Alternative measures of Democracy	30 to 212 country level observations	Correlations (Pearson accompanied by p-values) between each index of pathogen richness and each measure of personality traits, Individualism/collectivism and democracy	• Negative correlation between contemporary human to human pathogen prevalence and extraversion/openness • Negative (positive) correlation between contemporary human to human pathogen prevalence and individualism (collectivism) • Negative correlation between contemporary human to human pathogen prevalence and democracy
Van Leeuwen et al. (2012)	• Murray and Schaller (2010) historical	Alternative moral values from the moral foundations Questionnaire (MFQ): • Ingroup/loyalty	Cross-country individual level analysis for a sample that ranges	Multilevel modeling (hierarchical linear regression) between historical/contemporary regional pathogen prevalence and moral foundation scores	Historical (but not contemporary) pathogen prevalence significantly predicted endorsement of the binding foundations

	prevalence of infectious diseases • Fincher et al. (2008) contemporary prevalence of infectious diseases	• Authority/respect • Purity/sanctity • Harm/care • Fairness/reciprocity	between 78 and 82 countries		
Welzel and Delhey (2015)	Murray and Schaller (2010) historical prevalence of infectious diseases	Composite measure of out-group trust using survey question of the WVS	71 country level observations	Bivariate OLS regressions between historical pathogen prevalence and out-group trust	Historical pathogen prevalence is negatively correlated with out-group trust
Zhang (2018)	• Murray and Schaller (2010) historical prevalence of infectious diseases • Fincher and Thornhill (2012) contemporary prevalence of infectious diseases	Composite measure of in-group and out-group trust using survey question of the WVS	Cross-country individual level analysis for a sample that ranges between 70 and 77 countries	Multilevel regression models that relate pathogen prevalence and in-group/out-group trust	Pathogen stress—measured either as contemporary or historical pathogen prevalence—is not correlated with ingroup trust. However, pathogen stress significantly curvilinearly correlated with outgroup trust.

Table A2: Principal component analysis

	PC1	PC2	PC3	PC4	PC5	PC6
Proportions of variance	0.49	0.18	0.12	0.09	0.08	0.04
Cumulative variance	0.49	0.67	0.79	0.88	0.96	1.00
Loadings of principal components						
people met for the first time trust	0.44	-0.17	-0.20	0.57	0.64	0.05
another nationality trust	0.47	-0.35	0.31	-0.10	-0.17	-0.72
another religion trust	0.46	-0.35	0.34	-0.12	-0.25	0.69
neighborhood trust	0.42	0.23	-0.40	-0.72	0.29	0.02
people they know trust	0.39	0.38	-0.44	0.35	-0.62	-0.02
family trust	0.21	0.73	0.62	0.08	0.18	0.00
Eigenvalues	2.94	1.10	0.71	0.52	0.47	0.26
Kaiser criterion	2					

Table A3. List of SCCS societies by region and country

Society	Region	Country	Society	Region	Country	Society	Region	Country
Ainu	EAP	JPN	Jivaro	LAC	ECU	Burusho	SAS	PAK
Balinese	EAP	IDN	Mapuche	LAC	CHL	Gond	SAS	IND
Gilyak	EAP	JPN	Mundurucu	LAC	BRA	Lakher	SAS	IND
Iban	EAP	MYS	Nambicuara	LAC	BRA	Lepcha	SAS	BTN
Ifugao	EAP	PHL	Papago	LAC	MEX	Santal	SAS	IND
Kapauku	EAP	IDN	Shavante	LAC	BRA	Amhara	SSA	ETH
Manus	EAP	PNG	Timbira	LAC	BRA	Azande	SSA	COD
Maori	EAP	NZL	Warrau	LAC	VEN	Bambara	SSA	MLI
Mbau Fijians	EAP	FJI	Yahgan	LAC	CHL	Fon	SSA	BEN
Negri Sembilan	EAP	MYS	Basseri	MENA	IRN	Ganda	SSA	UGA
Orokaiva	EAP	PNG	Egyptians	MENA	EGY	Hausa	SSA	NGA
Semang	EAP	MYS	Kurd	MENA	IRQ	Kikuyu	SSA	KEN
Tikopia	EAP	SLB	Riffians	MENA	MAR	Kung Bushmen	SSA	NAM
Tiwi	EAP	AUS	Rwala Bedouin	MENA	SYR	Lozi	SSA	ZMB
Toradja	EAP	IDN	Bellacoola	NAM	CAN	Masai	SSA	TZA
Trobrianders	EAP	PNG	Chiricahua	NAM	USA	Mbuti	SSA	COD
Western Samoans	EAP	WSM	Comanche	NAM	USA	Mende	SSA	SLE
Yapese	EAP	FSM	Copper Eskimo	NAM	CAN	Nyakyusa	SSA	TZA
Gheg Albanians	ECA	ALB	Gros Ventre	NAM	USA	Otoro Nuba	SSA	SDN
Irish	ECA	IRL	Havasupai	NAM	USA	Shilluk	SSA	SSD
Kazak	ECA	KGZ	Huron	NAM	USA	Somali	SSA	SOM
Abipon	LAC	ARG	Klamath	NAM	USA	Suku	SSA	COD
Aweikoma	LAC	BRA	Pawnee	NAM	USA	Tallensi	SSA	GHA
Aztec	LAC	MEX	Saulteaux	NAM	CAN	Teda	SSA	TCD
Carib (Barama)	LAC	GUY	Slave	NAM	CAN	Tiv	SSA	NGA
Cayapa	LAC	ECU	Yokuts (Lake)	NAM	USA			
Goajiro	LAC	VEN	Andamanese	SAS	IND			

Notes: EAP stands for East Asia and Pacific; ECA for Europe and Central Asia; LAC for Latin America and Caribbean; MENA for Middle East and North Africa; NAM for North America; SAS for South Asia; SSA for Sub-Saharan Africa.

Table A4. SCCS societies of our sample vs. the whole sample of 186 societies

	Sample	**All societies**	**Difference**	**p-Value**
SCCS pathogens	0.49	0.46	0.03	0.49
absolute latitude	21.63	22.89	-1.26	0.60
precipitation	111.82	113.7	-1.88	0.86
tropical	0.44	0.44	0.00	0.98
elevation	0.66	0.63	0.03	0.73
distance to coast	3.8	3.4	0.40	0.45
ruggedness	1.25	1.37	-0.12	0.6
land quality	0.38	0.37	0.00	0.91
area	88337.41	1.40E+05	-47309.68	0.55
population density	3.63	3.76	-0.13	0.63
kinship	0.66	0.65	0.01	0.84

Table A5. Main variables used in cross-country estimations

	Description	Source	mean	st. dev	min	max
first time radius	Difference between trust towards people met for the first time and family trust	European Values Survey (EVS) and World Values Survey (WVS) 2017-2022	-1.718	0.306	-2.455	-0.993
another nationality radius	Difference between trust towards people of other nationality and family trust	EVS and WVS 2017-2022	-1.466	0.364	-2.238	-0.706
another religion radius	Difference between trust towards people of other religion and family trust	EVS and WVS 2017-2022	-1.392	0.318	-2.369	-0.744
neighbourhood radius	Difference between trust towards neighbours and family trust	EVS and WVS 2017-2022	-0.901	0.201	-1.505	-0.351
people known radius	Difference between trust towards people known personally and family trust	EVS and WVS 2017-2022	-0.763	0.271	-1.415	-0.126
average radius	Difference between average trust towards neighbours, people know personally, people that one meets for the first time, people of another nationality, people of another religion and family trust	EVS and WVS 2017-2022	-1.244	0.261	-1.821	-0.626
pathogen stress	Index measuring the historical prevalence of infectious diseases (leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus) in a particular country	Murray and Schaller (2010)	-0.069	0.594	-1.178	1.195
absolute latitude	The absolute value of the latitude of a country's approximate geodesic centroid.	Galor and Özak (2016)	35.599	16.309	2.000	65.000
precipitation	Mean precipitation per annum	Galor and Özak (2016)	87.870	55.853	2.911	233.933
temperature volatility	Volatility of temperature	Galor and Özak (2016)	13.477	5.405	3.698	27.385
tropical	Percent of land within the country in tropical and subtropical areas	Galor and Özak (2016)	0.209	0.350	0.000	1.000
elevation	The mean elevation of a country in km above sea level	Galor and Özak (2016)	0.560	0.492	0.024	2.674
island	An indicator for whether a country shares a land border with any other country	Galor and Özak (2016)	0.147	0.356	0.000	1.000
landlocked	An indicator for whether or not a country is landlocked	Galor and Özak (2016)	0.187	0.392	0.000	1.000
distance to waterway	The distance, in thousands of km, from a GIS grid cell to the nearest ice-free coastline or sea-navigable river, averaged across the grid cells of a country	Galor and Özak (2016)	269.573	466.014	11.040	2385.580
ruggedness	An index that quantifies small-scale terrain irregularities in each country	Nunn and Puga (2012)	1.667	1.262	0.037	5.717
land quality	Average probability within a region that a particular grid cell will be cultivated	Ramankutty et al. (2002)	0.433	0.236	0.003	0.900
Neolithic transition timing	The number of thousand years elapsed (as of the year 2000) since the majority of the population residing within a country's modern national borders began practicing sedentary agriculture as the primary mode of subsistence	Putterman (2010)	5897.907	2266.856	800.000	10500.000
European colony	An indicator for whether or not a country was colonized by a European nation (UK, Spain, France, Portugal, and other European). Summary statistics are provided for the UK	Acemoglu et al. (2002)	0.173	0.381	0.000	1.000
Legal origins	Legal origin of the Company Law or Commercial Code of a country. The five legal origin possibilities are: (i) UK, (ii) France, (iii) German, (iv) Scandinavian, and (v) Socialist. Summary statistics for the UK	La Porta et al. (1992)	0.149	0.358	0.000	1.000
GDP per capita	The logged value of GDP per capita, PPP, in constant 2005 U.S. dollars for the year 2005	World Development Indicators	9.522	0.967	6.639	11.041
years of schooling	Average number of years of schooling in 2005	Barro and Lee (2013)	9.317	2.147	4.213	12.893
% religion	Percentage of major religion (Muslims, Protestants, or Catholics) in each country. Summary statistics for Protestants	La Porta et al. (1999)	12.661	24.930	0.000	97.800

Table A6. Main variables used in individual-level estimations

	Description	Source	mean	st. dev	min	max
first time radius	Difference between trust towards people met for the first time and family trust	EVS and WVS 2017-2022	-1.728	0.914	-3.000	3.000
another nationality radius	Difference between trust towards people of other nationality and family trust	EVS and WVS 2017-2022	-1.475	0.958	-3.000	3.000
another religion radius	Difference between trust towards people of other religion and family trust	EVS and WVS 2017-2022	-1.394	0.944	-3.000	3.000
neighbourhood radius	Difference between trust towards neighbours and family trust	EVS and WVS 2017-2022	-0.907	0.804	-3.000	3.000
people known radius	Difference between trust towards people known personally and family trust	EVS and WVS 2017-2022	-0.776	0.822	-3.000	3.000
average radius	Difference between average trust towards neighbours, people know personally, people that one meets for the first time, people of another nationality, people of another religion and family trust	EVS and WVS 2017-2022	-1.253	0.708	-3.000	3.000
married	Dummy variable that takes the value one if the respondent is married (or living together as married), and zero otherwise	EVS and WVS 2017-2022	0.608	0.488	0.000	1.000
age	The respondent's age	EVS and WVS 2017-2022	45.353	17.277	16.000	82.000
gender	The gender of the respondent. It is assigned a value of one if it is female, and zero otherwise	EVS and WVS 2017-2022	0.535	0.499	0.000	1.000
religious denomination	The respondent is considered as a Muslim, Protestant, or Catholic. Summary statistics for Protestants	EVS and WVS 2017-2022	0.109	0.311	0.000	1.000
educational attainment	Highest educational level attained, separated by lower, middle and upper. Summary statistics for middle educational attainment	EVS and WVS 2017-2022	0.396	0.489	0.000	1.000
income level	The respondent's income level. The original scale of income is recoded into three categories: high, middle and low. Summary statistics for middle income level	EVS and WVS 2017-2022	0.433	0.495	0.000	1.000

Notes: Description and summary statistics of variables used at the country level are provided in Table A1.

Table A7. Main variables used in SCCS analysis

	Description	Source	mean	st. dev	min	max
other societies violence radius	The difference between the dissaproval of violence towards people in other societies and people of the local community	Ross (1983)	-1.952	1.007	-3.000	0.000
same society violence radius	The difference between the disapproval of violence towards people of the same society and people of the local community	Ross (1983)	-0.922	0.914	-3.000	0.000
average violence radius	The difference between the average disapproval of violence towards people of the same society and other societies and that of people of the same community	Ross (1983)	-1.426	0.795	-3.000	0.000
SCCS pathogens	An index that takes values from zero to one, with higher values indicating that more of the coded pathogens (leishmanias, trypanosomes, malaria, shistosomes, filariae, and spirochetes) were present within the territory of the ethnic group	Low (1994)	0.492	0.327	0.000	1.000
absolute latitude	The absolute value of the latitude of an ethnic group's approximate geodesic centroid	Galor and Özak (2016)	21.633	17.313	0.418	68.308
precipitation	Mean precipitation per annum	Galor and Özak (2016)	111.824	78.740	0.000	305.154
tropical	Percent of land in tropical and subtropical areas		0.443	0.412	0.000	1.000
elevation	The mean elevation of an ethnic group's territory in km above sea level	Galor and Özak (2016)	0.657	0.628	0.005	3.581
distance to coast	Average distance from each point in the ethnic group's territory to the nearest point on the coast, in decimal degrees	Fenske (2013)	3.802	4.100	0.000	14.599
ruggedness	An index that quantifies small-scale terrain irregularities in each ethnic group	Galor and Özak (2016)	1.254	1.706	0.045	10.760
land quality	constraints on rain-fed agriculture that were measured as part of the Food and Agriculture Organization's Global Agro-Ecological Zones (FAO-GAEZ) project	Fenske (2013)	0.378	0.298	0.000	0.962
area	Area of ethnic homeland	Galor and Özak (2016)	88337.411	2.28e+05	0.113	1.83e+06
population density	An ordered variable that takes the following values from 1 (1 person per 5 sq. mile) to 7 (over 500 persons per sq. mile)	Murdock and White (1969)	3.633	1.903	1.000	7.000
kinship	Kinship tightness index	Enke (2019)	0.658	0.289	0.000	1.000

Table A8. Main variables used in second generation analysis

	Description	Source	mean	st. dev	min	max
first time radius	Difference between trust towards people met for the first time and family trust	EVS and WVS 2017-2022	-1.628	0.862	-3.000	2.000
another nationality radius	Difference between trust towards people of other nationality and family trust		-1.148	0.859	-3.000	2.000
another religion radius	Difference between trust towards people of other religion and family trust	EVS and WVS 2017-2022	-1.188	0.862	-3.000	3.000
neighbourhood radius	Difference between trust towards neighbours and family trust	EVS and WVS 2017-2022	-0.906	0.774	-3.000	3.000
people known radius	Difference between trust towards people known personally and family trust	EVS and WVS 2017-2022	-0.614	0.736	-3.000	3.000
average radius	Difference between average trust towards neighbours, people know personally, people that one meets for the first time, people of another nationality, people of another religion and family trust	EVS and WVS 2017-2022	-1.090	0.649	-3.000	2.400
pathogen stress	Index measuring the historical prevalence of infectious diseases (leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus) in the country of origin.	Murray and Schaller (2010)	-0.100	0.642	-1.178	1.195
absolute latitude	The absolute value of the latitude of a country's of origin approximate geodesic centroid.	Galor and Özak (2016)	43.246	12.194	1.000	72.000
precipitation	Mean precipitation per annum in the country of origin.	Galor and Özak (2016)	64.096	30.628	2.911	241.718
temperature volatility	Volatility of temperature.	Galor and Özak (2016)	16.223	5.508	3.032	27.385
tropical	Percent of land in tropical and subtropical areas in the country of origin	Galor and Özak (2016)	0.084	0.230	0.000	1.000
elevation	The mean elevation of a country in km above sea level in the country of origin.	Galor and Özak (2016)	0.604	0.501	0.024	2.674
island	An indicator for whether a country of origin shares a land border with any other country.	Galor and Özak (2016)	0.065	0.247	0.000	1.000
landlocked	An indicator for whether or not a country of origin is landlocked.	Galor and Özak (2016)	0.126	0.332	0.000	1.000
distance to waterway	The distance, in thousands of km, from a GIS grid cell to the nearest ice-free coastline or sea-navigable river, averaged across the grid cells of a country of origin.	Galor and Özak (2016)	485.843	741.722	7.952	2385.580
ruggedness	An index that quantifies small-scale terrain irregularities in each country of origin.	Nunn and Puga (2012)	1.422	0.928	0.016	7.811
land suitability	Average probability within a country of origin that a particular grid cell will be cultivated	Ramankutty et al. (2002)	0.450	0.218	0.003	0.920
Neolithic transition timing	The number of thousand years elapsed (as of the year 2000) since the majority of the population residing within a country's of origin modern national borders began practicing sedentary agriculture as the primary mode of subsistence.	Putterman (2010)	6647.367	1939.960	400.000	10500.000
European colony	An indicator for whether or not a country of origin was colonized by a European nation (UK, Spain, France, Portugal, and other European). Summary statistics are provided for the UK.	Acemoglu et al. (2002)	0.067	0.251	0.000	1.000
Legal origins	Legal origin of the Company Law or Commercial Code of a country of origin. The five legal origin possibilities are: (i) UK, (ii) France, (iii) German, (iv) Scandinavian, and (v) Socialist. Summary statistics for the UK.	La Porta et al. (1999)	0.103	0.303	0.000	1.000

Notes: Summary statistics are provided only for the dependent variables and those controls that are calculated for the country of origin. For individual controls (e.g., age) summary statistics provided in Table A2 are representative.

Table A9. Pathogen stress and the radius of trust: cross-country analysis, Principal components

Dep. variable:	*out-group*		*in-group*		*PCA radius*	
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.612***	-0.308*	0.241	0.384	-0.644***	-0.415**
	(-5.206)	(-1.857)	(1.603)	(1.461)	(-4.360)	(-2.527)
Region FE	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓
R2	0.515	0.915	0.419	0.806	0.420	0.901
Observations	76	59	76	59	76	59

Notes: The unit of observation is the country. Column titles refer to the dependent variable. We employ Principal Component Analysis (PCA) to identify key variables summarizing the variance in six trust-related survey questions available in the joint EVS/WVS 2017-2022 dataset about people met for the first time, people of other nationalities, people of other religions, neighbours, people known and family. In columns (1)-(2) the out-group trust component is associated with socially distant groups, while in columns (3)-(4) the in-group trust component relates to familiar groups, such as family. In columns (5)-(6) the variable PCA radius is the difference between the first and second principal components. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

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Table A10. Pathogen stress and the radius of trust: cross-country analysis, additional controls

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress	-0.607***	-0.603**	-0.283	-0.151	-0.570**	-0.422*	-0.260	-0.303	-0.665**	-0.696**	-0.543***	-0.478**
	(-3.005)	(-2.721)	(-1.306)	(-0.646)	(-2.640)	(-1.867)	(-0.927)	(-0.922)	(-2.166)	(-2.118)	(-3.051)	(-2.432)
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State & Kinship	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fraction, Democ. & Individualism		✓		✓		✓		✓		✓		✓
R2	0.896	0.904	0.883	0.892	0.851	0.867	0.875	0.887	0.862	0.884	0.912	0.922
Observations	59	58	59	58	59	58	59	58	59	58	59	58

Notes: The unit of observation is the country. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five country-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Additional controls include State & Kinship, representing the state antiquity index and the kinship tightness index, respectively. Fraction., Democ. & Individualism stand for the contemporary ethnic fractionalization index, the measure of polity 2, and individualism. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A11. Pathogen stress and the radius of trust: cross-country analysis, contemporary pathogen stress

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress		-0.623***		-0.312		-0.520**		-0.315		-0.601**		-0.541***
		(-3.312)		(-1.584)		(-2.384)		(-1.179)		(-2.252)		(-3.358)
cont. pathogen stress	0.254	0.307	-0.045	-0.018	-0.233	-0.189	0.372	0.399	0.549	0.600	0.143	0.189
	(0.915)	(1.203)	(-0.167)	(-0.066)	(-0.697)	(-0.605)	(1.336)	(1.537)	(1.385)	(1.620)	(0.572)	(0.862)
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R2	0.865	0.901	0.866	0.875	0.815	0.840	0.871	0.880	0.823	0.856	0.882	0.909
Observations	59	59	59	59	59	59	59	59	59	59	59	59

Notes: The unit of observation is the country. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five country-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. The estimates include contemporary pathogen stress, as developed by Fincher et al. (2008), which focuses on seven classes of pathogens: leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A12. Pathogen stress and the radius of trust: cross-country analysis, excluding countries in tropical and subtropical areas

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.489**	-0.293	-0.535**	-0.309	-0.333	-0.467**
	(-2.221)	(-1.108)	(-2.224)	(-1.350)	(-0.957)	(-2.470)
Region FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.901	0.864	0.851	0.923	0.883	0.917
Observations	41	41	41	41	41	41

Notes: The unit of observation is the country. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five country-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude countries located in tropical and subtropical areas. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A13. Pathogen stress and the radius of trust: cross-country analysis, excluding the longest countries of the sample

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.620***	-0.297	-0.528**	-0.269	-0.599*	-0.533***
	(-3.315)	(-1.439)	(-2.240)	(-0.955)	(-1.924)	(-3.100)
Region FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.889	0.862	0.815	0.871	0.835	0.897
Observations	54	54	54	54	54	54

Notes: The unit of observation is the country. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five country-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in people known from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude the countries of the sample that are among the 10 longest countries of the world. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A14. Pathogen stress and the radius of trust: cross-country analysis, WVS waves 5 & 6

Dep. Variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.591**	-0.537***	-0.607***	-0.015	-0.251	-0.514**
	(-2.659)	(-2.850)	(-3.178)	(-0.056)	(-0.965)	(-2.540)
Region FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.823	0.864	0.847	0.760	0.785	0.833
Observations	63	63	63	63	63	63

Notes: The unit of observation is the country. Column titles refer to the dependent variable. In columns (1)-(5) using the WVS waves 5 & 6 (2005-2009 & 2010-2014), we construct five country-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, temperature volatility, tropical, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European), GDP per capita, years of schooling, and percentages of major religions (Muslims, Protestants, and Catholics). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A15. Pathogen stress and the radius of trust: individual-level analysis, Principal components

Dep. variable:	*out-group*		*in-group*		*PCA radius*	
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.295***	-0.100*	0.076*	0.109**	-0.291***	-0.142***
	(-4.818)	(-1.742)	(1.861)	(2.224)	(-5.970)	(-2.780)
Region FE	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓
R2	0.136	0.250	0.042	0.075	0.085	0.205
Observations	96535	83002	96535	83002	96535	83002

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. We employ Principal Component Analysis (PCA) to identify key variables summarizing the variance in six trust-related survey questions available in the joint EVS/WVS 2017-2022 dataset about people met for the first time, people of other nationalities, people of other religions, neighbours, people known and family. In columns (1)-(2) the out-group trust component is associated with socially distant groups, while in columns (3)-(4) the in-group trust component relates to familiar groups, such as family. In columns (5)-(6) the variable PCA radius is the difference between the first and second principal components. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

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Table A16. Pathogen stress and the radius of trust: individual-level analysis, additional controls

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress	-0.171***	-0.169***	-0.075	-0.009	-0.160***	-0.112**	-0.011	-0.043	-0.154**	-0.150**	-0.153***	-0.126**
	(-3.724)	(-3.721)	(-1.274)	(-0.159)	(-2.904)	(-2.405)	(-0.234)	(-0.879)	(-2.416)	(-2.174)	(-2.703)	(-2.246)
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State & Kinship	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fraction, Democ. & Individualism		✓		✓		✓		✓		✓		✓
R2	0.107	0.107	0.134	0.134	0.099	0.099	0.072	0.074	0.105	0.107	0.138	0.138
Observations	84372	83089	81410	80142	81375	80119	85062	83768	85332	84024	79279	78054

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Additional controls include State & Kinship, representing the state antiquity index and the kinship tightness index, respectively. Fraction., Democ. & Individualism stand for the contemporary ethnic fractionalization index, the measure of polity 2, and individualism. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A17. Pathogen stress and the radius of trust: individual-level analysis, contemporary pathogen stress

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress		-0.210***		-0.091*		-0.154***		-0.081*		-0.149**		-0.180***
		(-4.798)		(-1.735)		(-3.391)		(-1.885)		(-2.511)		(-3.824)
cont. pathogen stress	0.152**	0.220***	-0.005	0.025	-0.056	-0.006	0.149**	0.175***	0.053	0.101	0.072	0.131**
	(2.478)	(3.450)	(-0.077)	(0.397)	(-1.047)	(-0.102)	(2.644)	(3.574)	(0.685)	(1.231)	(1.193)	(2.240)
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R2	0.101	0.106	0.132	0.132	0.098	0.100	0.072	0.073	0.099	0.101	0.133	0.137
Observations	88267	88267	85206	85206	85170	85170	88995	88995	89260	89260	83002	83002

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. The estimates include contemporary pathogen stress, as developed by Fincher et al. (2008), which focuses on seven classes of pathogens: leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A18. Pathogen stress and the radius of trust: individual-level analysis, excluding countries in tropical and subtropical areas

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.150***	-0.087	-0.143**	-0.036	-0.115	-0.145***
	(-3.175)	(-1.465)	(-2.283)	(-0.738)	(-1.399)	(-2.749)
Region FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.149	0.155	0.128	0.084	0.120	0.181
Observations	57607	55052	54834	58308	58584	53183

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude countries located in tropical and subtropical areas. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A19. Pathogen stress and the radius of trust: individual-level analysis, excluding the longest countries of the sample

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.149***	-0.077	-0.151***	-0.043	-0.120**	-0.142***
	(-3.684)	(-1.624)	(-3.461)	(-0.858)	(-2.134)	(-3.088)
Region FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.103	0.127	0.091	0.073	0.100	0.131
Observations	79778	77173	77147	80483	80721	75278

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude the countries of the sample that are among the 10 longest countries of the world. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A20. Pathogen stress and the radius of trust: individual-level analysis, WVS waves 5 & 6

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.179***	-0.110	-0.104	-0.002	0.014	-0.109
	(-3.634)	(-1.094)	(-1.465)	(-0.029)	(0.298)	(-1.568)
Region FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.071	0.114	0.122	0.062	0.052	0.094
Observations	108319	104864	105358	109390	109329	102608

Notes: The unit of observation is the individual. Column titles refer to the dependent variable. In columns (1)-(5) using the WVS waves 5 & 6 (2005-2009 & 2010-2014), we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the level of the country where the interview was conducted, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A21. Pathogen stress and disapproval of violence: SCCS analysis, quality of violence data

Dep. variable:	*other societies violence radius*	*same society violence radius*	*average violence radius*
	(1)	(2)	(3)
SCCS pathogens	-0.620*	-0.268	-0.576
	(-1.823)	(-0.807)	(-1.619)
Region FE	✓	✓	✓
Controls	✓	✓	✓
R2	0.318	0.246	0.202
Observations	59	70	57

Notes: The unit of analysis is the ethnic group from the Standard Cross-Cultural Sample. Column titles refer to the dependent variable. In column (1), using Ross' (1983) data we calculate the difference between the disapproval of violence towards people in other societies and the local community. In column (2), we compute the difference between the disapproval of violence towards people of the same society and the local community. In column (3), we find the difference between the average disapproval of violence towards people outside the local community and those within it. SCCS pathogens, constructed using data from Low (1994), measures the historical presence of infectious diseases at the ethnicity level including leishmanias, trypanosomes, malaria, shistosomes, filariae, and spirochetes. Observation with weak quality, according to Ross (1983), are dropped from the estimates. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, tropical, elevation, distance to coast, ruggedness, land quality, area, population density, and kinship tightness. The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A22. Pathogen stress and disapproval of violence: SCCS analysis, Cook's distance

Dep. variable:	*other societies violence radius*	*same society violence radius*	*average violence radius*
	(1)	(2)	(3)
SCCS pathogens	-0.854***	-0.152	-0.885**
	(-2.816)	(-0.445)	(-2.300)
Region FE	✓	✓	✓
Controls	✓	✓	✓
R2	0.572	0.340	0.504
Observations	52	70	49

Notes: The unit of analysis is the ethnic group from the Standard Cross-Cultural Sample. Column titles refer to the dependent variable. In column (1), using Ross' (1983) data we calculate the difference between the disapproval of violence towards people in other societies and the local community. In column (2), we compute the difference between the disapproval of violence towards people of the same society and the local community. In column (3), we find the difference between the average disapproval of violence towards people outside the local community and those within it. SCCS pathogens, constructed using data from Low (1994), measures the historical presence of infectious diseases at the ethnicity level including leishmanias, trypanosomes, malaria, shistosomes, filariae, and spirochetes. We exclude observations with a Cook's distance above a common rule-of-thumb threshold (four divided by the number of observations). Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, tropical, elevation, distance to coast, ruggedness, land quality, area, population density, and kinship tightness. The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A23. Pathogen stress and disapproval of violence: SCCS analysis, clustered errors

Dep. variable:	*other societies violence radius*	*same society violence radius*	*average violence radius*
	(1)	(2)	(3)
SCCS pathogens	-0.630*	-0.131	-0.570
	(-1.693)	(-0.343)	(-1.362)
Region FE	✓	✓	✓
Controls	✓	✓	✓
R2	0.284	0.216	0.172
Observations	61	75	59

Notes: The unit of analysis is the ethnic group from the Standard Cross-Cultural Sample. Column titles refer to the dependent variable. In column (1), using Ross' (1983) data we calculate the difference between the disapproval of violence towards people in other societies and the local community. In column (2), we compute the difference between the disapproval of violence towards people of the same society and the local community. In column (3), we find the difference between the average disapproval of violence towards people outside the local community and those within it. SCCS pathogens, constructed using data from Low (1994), measures the historical presence of infectious diseases at the ethnicity level including leishmanias, trypanosomes, malaria, shistosomes, filariae, and spirochetes. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, tropical, elevation, distance to coast, ruggedness, land quality, area, population density, and kinship tightness. The coefficients are standardized beta coefficients. Heteroskedasticity robust errors are clustered at the language subfamily level, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A24. Pathogen stress and disapproval of violence: SCCS analysis, ethnic group year of observation 1850-1940

Dep. variable:	*other societies violence radius*	*same society violence radius*	*average violence radius*
	(1)	(2)	(3)
SCCS pathogens	-1.192**	0.117	-0.676
	(-2.069)	(0.239)	(-0.980)
Region FE	✓	✓	✓
Controls	✓	✓	✓
R2	0.597	0.316	0.450
Observations	41	51	40

Notes: The unit of analysis is the ethnic group from the Standard Cross-Cultural Sample. Column titles refer to the dependent variable. In column (1), using Ross' (1983) data we calculate the difference between the disapproval of violence towards people in other societies and the local community. In column (2), we compute the difference between the disapproval of violence towards people of the same society and the local community. In column (3), we find the difference between the average disapproval of violence towards people outside the local community and those within it. SCCS pathogens, constructed using data from Low (1994), measures the historical presence of infectious diseases at the ethnicity level including leishmanias, trypanosomes, malaria, shistosomes, filariae, and spirochetes. We exclude ethnic groups where year of observation is before 1850 or after 1940. Region fixed effects include dummies for East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Controls include absolute latitude, precipitation, tropical, elevation, distance to coast, ruggedness, land quality, area, population density, and kinship tightness. The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are used, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A25. Second generation migrants by country of residence

Country of residence	Total no. of 2nd gen. migrants	No. of origin countries	Prevalent country of origin	No. of 2nd gen. migrants
Albania	16	3	Greece	13
Andorra	216	10	Spain	167
Argentina	58	7	Paraguay	17
Armenia	126	11	Georgia	31
Austria	101	24	Germany	27
Azerbaijan	36	6	Armenia	21
Belarus	102	8	Russia	64
Bolivia	21	4	Argentina	8
Bosnia and Herzegovina	18	3	Croatia	15
Brazil	18	10	Germany	3
Brazil	18	10	Paraguay	3
Brazil	18	10	Portugal	3
Bulgaria	26	7	Romania	10
Colombia	8	3	Venezuela	5
Croatia	115	13	Bosnia and Herzegovina	82
Cyprus	76	9	Turkey	58
Czech Republic	100	15	Slovakia	55
Denmark	109	25	Germany	28
Ecuador	16	6	Colombia	9
Egypt	2	2	Turkey	1
Egypt	2	2	Libya	1
Estonia	172	13	Russia	124
Ethiopia	1	1	Germany	1
Finland	10	4	Russia	6
France	171	19	Algeria	43
Georgia	67	12	Russia	29
Germany	255	35	Poland	54
Greece	48	14	Turkey	30
Guatemala	5	2	Honduras	4
Hong Kong	309	6	China	301
Hungary	35	9	Romania	16
Iceland	47	11	Denmark	17
Iran	9	3	Iraq	5
Italy	26	16	Switzerland	5
Italy	26	16	Croatia	5
Japan	5	3	Republic of Korea	3
Kazakhstan	82	9	Russia	45
Kyrgyzstan	68	7	Russia	34
Lebanon	3	2	Egypt	2
Lithuania	67	7	Russia	35
Macau	123	5	China	117
Malaysia	70	12	China	35
Montenegro	23	6	Bosnia and Herzegovina	11
Myanmar	1	1	China	1
Netherlands	98	25	Germany	35
New Zealand	85	1	United Kingdom	85
North Macedonia	27	8	Greece	9
Norway	40	16	Sweden	8
Pakistan	105	5	India	98
Peru	4	3	Italy	2
Philippines	2	2	Netherlands	1
Poland	53	7	Germany	17
Puerto Rico	30	5	United States of America	18
Romania	7	4	Republic of Moldova	3
Russia	150	14	Ukraine	69
Serbia	113	11	Bosnia and Herzegovina	58
Slovakia	38	6	Hungary	18
Slovenia	56	9	Croatia	28
Spain	12	7	Morocco	4
Sweden	83	19	Finland	29
Switzerland	456	36	Italy	130
Taiwan	82	6	China	75
Tajikistan	10	3	Uzbekistan	8
Thailand	7	4	Malaysia	3
Tunisia	3	2	Algeria	2
Turkey	8	4	Bulgaria	3
Turkey	8	4	Greece	3
Ukraine	67	8	Russia	49
United Kingdom	78	24	Ireland	23
United States of America	201	43	Mexico	72
Viet Nam	3	1	China	3
Zimbabwe	49	4	Malawi	28

Table A26. Second generation migrants by country of origin

Country of origin	Total no. of 2nd gen. migrants	Total no. of countries of residence	Prevalent country of residence	No. of 2nd gen. migrants	Country of origin	Total no. of 2nd gen. migrants	Total no. of countries of residence	Prevalent country of residence	No. of 2nd gen. migrants
Afghanistan	2	2	Sweden	1	Kazakhstan	45	7	Russia	19
Albania	13	6	Montenegro	4	Kyrgyzstan	4	4	Tajikistan	1
Algeria	49	4	France	43	Laos	1	1	Thailand	1
Angola	2	2	Switzerland	1	Latvia	16	5	Estonia	7
Argentina	10	3	Bolivia	8	Lebanon	1	1	Germany	1
Armenia	44	5	Azerbaijan	21	Libya	2	2	Egypt	1
Australia	6	5	Germany	2	Lithuania	14	6	Germany	4
Austria	93	18	Switzerland	45	Luxembourg	2	1	Austria	2
Azerbaijan	46	6	Armenia	25	Malawi	28	1	Zimbabwe	28
Bangladesh	4	1	Pakistan	4	Malaysia	8	4	Thailand	3
Belarus	65	6	Russia	27	Mali	3	2	France	2
Belgium	41	10	Netherlands	16	Mexico	72	1	United States of America	72
Bolivia	9	3	Argentina	7	Morocco	36	11	France	15
Bosnia and Herzegovina	185	10	Croatia	82	Mozambique	15	1	Zimbabwe	15
Brazil	8	5	United States of America	2	Myanmar	2	2	Macau	1
Bulgaria	11	8	Turkey	3	Nepal	1	1	Hong Kong	1
Cambodia	4	2	United States of America	3	Netherlands	32	12	Germany	10
Canada	19	6	United States of America	10	New Zealand	2	2	Netherlands	1
Chile	10	2	Bolivia	7	Nicaragua	3	2	Colombia	2
China	549	16	Hong Kong	301	Nigeria	1	1	Zimbabwe	1
Colombia	11	3	Ecuador	9	North Korea	1	1	United States of America	1
Congo	2	1	France	2	North Macedonia	27	10	Serbia	10
Congo	2	1	France	2	Norway	40	5	Denmark	21
Costa Rica	2	1	United States of America	2	Pakistan	18	5	United Kingdom	13
Croatia	101	13	Slovenia	28	Panama	2	2	United States of America	1
Cuba	11	5	United States of America	7	Paraguay	20	2	Argentina	17
Czech Republic	63	10	Germany	25	Peru	17	8	Bolivia	4
Denmark	33	5	Iceland	17	Philippines	12	2	United States of America	10
Dominican Republic	12	3	Puerto Rico	9	Poland	131	25	Germany	54
Egypt	3	2	Lebanon	2	Portugal	57	10	Andorra	18
El Salvador	6	1	United States of America	6	Republic of Korea	9	3	United States of America	5
Estonia	5	5	United Kingdom	1	Republic of Moldova	16	8	Ukraine	5
Ethiopia	1	1	Greece	1	Romania	50	12	Hungary	16
Finland	42	7	Sweden	29	Russia	465	24	Estonia	124
France	89	15	Switzerland	35	Slovakia	64	4	Czech Republic	55
Georgia	53	6	Armenia	31	Slovenia	32	8	Croatia	14
Germany	297	26	Switzerland	108	Spain	240	15	Andorra	167
Greece	62	15	Albania	13	Sri Lanka	8	6	Switzerland	2
Guatemala	4	2	United States of America	3	Sweden	36	10	Denmark	16
Guyana	1	1	United States of America	1	Switzerland	17	9	Italy	5
Haiti	3	2	United States of America	2	Syrian Arab Republic	22	8	Armenia	15
Honduras	6	2	Guatemala	4	Tajikistan	11	4	Russia	5
Hungary	59	12	Slovakia	18	Thailand	7	4	United States of America	2
Iceland	4	2	Sweden	2	Turkey	192	14	Cyprus	58
India	109	4	Pakistan	98	Turkmenistan	1	1	Kazakhstan	1
Indonesia	20	4	Malaysia	15	Ukraine	155	20	Russia	69
Iraq	8	4	Iran	5	United Kingdom	139	14	New Zealand	85
Ireland	29	6	United Kingdom	23	United States of America	69	19	Puerto Rico	18
Israel	2	1	United States of America	2	Uzbekistan	38	8	Kyrgyzstan	14
Italy	208	18	Switzerland	130	Venezuela	9	5	Colombia	5
Japan	6	5	Brazil	2	Viet Nam	8	4	United States of America	4

Table A27. Pathogen stress and the radius of trust: Second-generation migrants' analysis, Principal components

Dep. variable:	*out-group*		*in-group*		*PCA radius*	
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.101***	-0.121**	-0.029	-0.012	-0.071***	-0.097**
	(-4.427)	(-2.177)	(-0.874)	(-0.222)	(-3.224)	(-2.184)
Country FE	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓
R2	0.181	0.233	0.091	0.111	0.195	0.229
Observations	4863	4225	4863	4225	4863	4225

Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. We employ Principal Component Analysis (PCA) to identify key variables summarizing the variance in six trust-related survey questions available in the joint EVS/WVS 2017-2022 dataset about people met for the first time, people of other nationalities, people of other religions, neighbours, people known and family. In columns (1)-(2) the out-group trust component is associated with socially distant groups, while in columns (3)-(4) the in-group trust component relates to familiar groups, such as family. In columns (5)-(6) the variable PCA radius is the difference between the first and second principal components. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A28. Pathogen stress and the radius of trust: Second-generation migrants' analysis, additional controls

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress	-0.090**	-0.101**	-0.088**	-0.087**	-0.035	-0.030	-0.110**	-0.107**	-0.053	-0.040	-0.080**	-0.078*
	(-2.044)	(-2.173)	(-2.281)	(-2.283)	(-0.802)	(-0.706)	(-2.257)	(-2.114)	(-1.166)	(-0.939)	(-2.006)	(-1.970)
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State & Kinship	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethnic frac, Democ. & Individualism		✓		✓		✓		✓		✓		✓
R2	0.135	0.136	0.165	0.165	0.141	0.141	0.087	0.087	0.106	0.106	0.155	0.155
Observations	4508	4504	4314	4310	4284	4280	4519	4515	4553	4549	4175	4171

Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Additional controls include State & Kinship, representing the state antiquity index and the kinship tightness index, respectively. Fraction., Democ. & Individualism stand for the contemporary ethnic fractionalization index, the measure of polity 2, and individualism. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A29. Pathogen stress and the radius of trust: Second-generation migrants' analysis, contemporary pathogen stress

Dep. variable:	*first time radius*		*another nationality radius*		*another religion radius*		*neighborhood radius*		*people known radius*		*average radius*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
pathogen stress		-0.090**		-0.093**		-0.049		-0.101**		-0.045		-0.078**
		(-2.226)		(-2.319)		(-1.125)		(-2.119)		(-0.988)		(-2.050)
cont. pathogen stress	-0.040	-0.035	0.043	0.048	0.007	0.010	-0.079**	-0.073**	0.038	0.041	-0.009	-0.005
	(-0.992)	(-0.880)	(0.930)	(1.101)	(0.181)	(0.260)	(-2.209)	(-2.158)	(1.171)	(1.246)	(-0.230)	(-0.120)
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R2	0.135	0.136	0.163	0.163	0.142	0.142	0.087	0.088	0.106	0.106	0.157	0.157
Observations	4562	4562	4365	4365	4335	4335	4572	4572	4607	4607	4225	4225

Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. In columns (1)-(10) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in columns (9)-(10), the people known radius is derived by subtracting trust in known people from trust in family. In columns (11)-(12) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. The estimates include contemporary pathogen stress in the country of origin, as developed by Fincher et al. (2008), which focuses on seven classes of pathogens: leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A30. Pathogen stress and the radius of trust: Second-generation migrants' analysis, excluding countries of origin in tropical and subtropical areas

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.074**	-0.131***	-0.082**	-0.047	-0.021	-0.082**
	(-2.009)	(-3.488)	(-2.335)	(-1.100)	(-0.506)	(-2.301)
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.159	0.154	0.145	0.098	0.112	0.173
Observations	3474	3294	3263	3481	3511	3176

Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude countries of origin located in tropical and subtropical areas. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A31. Pathogen stress and the radius of trust: Second-generation migrants' analysis, excluding the longest countries of origin of the sample

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.080**	-0.108***	-0.053	-0.045	-0.034	-0.076**
	(-2.259)	(-2.870)	(-1.360)	(-1.055)	(-0.863)	(-2.077)
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.158	0.154	0.146	0.101	0.108	0.165
Observations	3291	3157	3127	3308	3327	3056

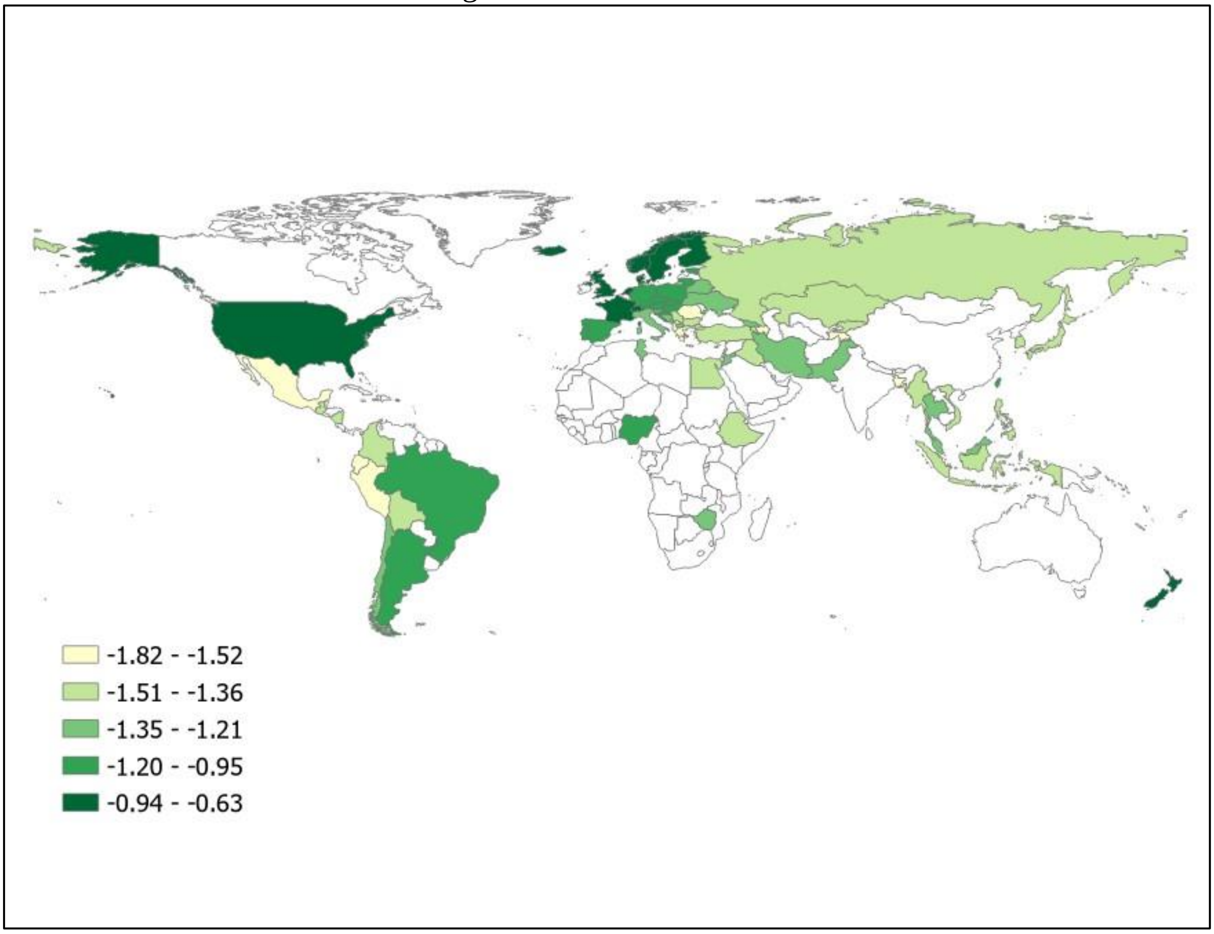
Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude countries of origin of the sample that are among the 10 longest countries of the world. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table A32. Pathogen stress and the radius of trust: Second-generation migrants' analysis, excluding countries of origin with a large sample of second-generation migrants

Dep. variable:	*first time radius*	*another nationality radius*	*another religion radius*	*neighborhood radius*	*people known radius*	*average radius*
	(1)	(2)	(3)	(4)	(5)	(6)
pathogen stress	-0.078**	-0.098***	-0.055	-0.083*	-0.056	-0.088**
	(-2.107)	(-2.743)	(-1.483)	(-1.925)	(-1.296)	(-2.502)
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
R2	0.139	0.170	0.158	0.096	0.101	0.158
Observations	3265	3130	3109	3283	3302	3034

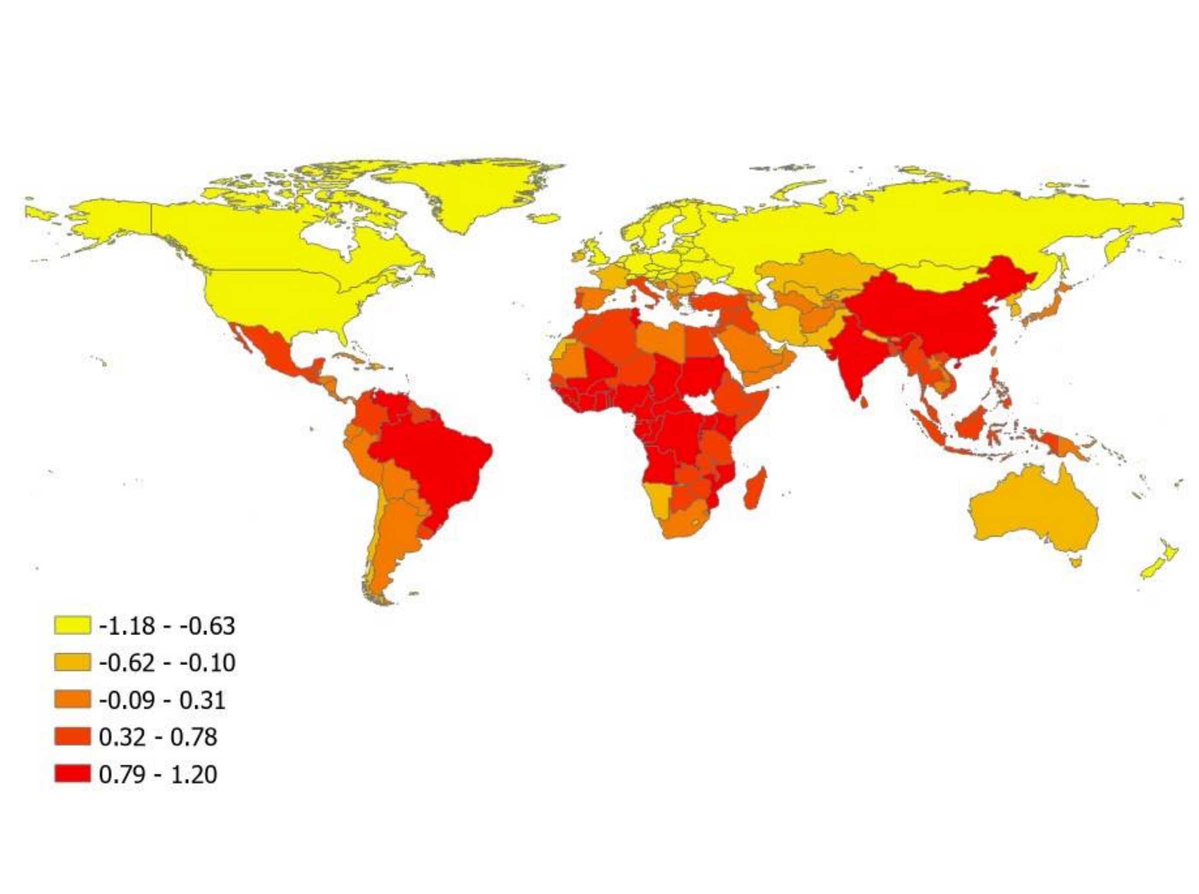
Notes: The unit of observation is a second-generation immigrant - i.e., individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. Column titles refer to the dependent variable. In columns (1)-(5) using the joint EVS/WVS 2017-2022 dataset, we construct five individual-level variables that measure social distance between participants' trust in their family and trust in five other distinct groups (people met for the first time, people of other nationalities, people of other religions, neighbours, people known). For example, in column (5), the people known radius is derived by subtracting trust in known people from trust in family. In column (6) the average radius is constructed by calculating the difference between the average trust in all non-family groups and trust in family. The main independent variable pathogen stress, obtained by Murray and Schaller (2010), measures country-level historical prevalence in the country of origin of the migrant of seven infectious diseases including leishmanias, trypanosomes, malaria, schistosomes, filariae, dengue, and typhus. Estimates exclude observations of second-generation migrants with origin from China, Germany, and Russia. All estimates include fixed effects for the country where the interview was conducted. Controls include basic individual characteristics age and age squared, gender, marital status, educational attainment (upper, middle, high), religious denomination (Muslim, Protestant, and Catholic) and income level (upper, middle, high) as well as country level controls (of the country of origin) absolute latitude, precipitation, temperature volatility, elevation, island, landlocked, distance to waterway, ruggedness, land quality, neolithic transition timing, legal origin dummies (British, French, German, Scandinavian and Socialist), a set of European colony dummies (British, French, Spanish, Portugal, and other European). The coefficients are standardized beta coefficients. Heteroskedasticity robust standard errors are clustered at the country of origin of the parents, and t-statistics are reported in the parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Figure A1. Radius of trust



Notes: The white polygons on the map represent countries for which data are not available. Darker colors indicate a smaller distance between the average trust in all groups (other than family) and family trust (EVS and WVS, 2017-2022).

Figure A2. Pathogen stress



Notes: The white polygons on the map represent countries for which data are not available, while the darker colors indicate higher historical disease prevalence (Murray and Schaller, 2010).

Appendix B. Vector-borne diseases included in our indices *pathogen stress* and *SCCS pathogens*

	Vector	Disease caused	Type of pathogen	Data Source (*)
1	Mosquito *Aedes*	Dengue	Virus	M+T
2	Sandflies	Leishmanias	Parasite	M+T and L
3	Lice/ticks	Lyme Disease (spirochetes)	Bacteria	L
4	Mosquito *Culex*	Lymphatic Filariasis [Elephantiasis]	Parasite	M+T and L
5	Mosquito *Anopheles*	Malaria	Parasite	M+T and L
6	Aquatic snails	Schistosomiasis	Parasite	M+T and L
7	Tsetse flies	Trypanosomiasis [Sleeping sickness]	Parasite	M+T and L
8	Lice/fleas	Typhus	Bacteria	M+T

Notes: (*) M+T: Murray and Schaller (2010), L: Low (1994). Information was obtained from the World Health Organization.

1. Dengue:
Dengue is a mosquito-borne viral infection causing a severe flu-like illness and sometimes causing a potentially lethal complication called severe dengue. Dengue is a rapidly emerging pandemic-prone viral disease widespread in tropical and subtropical regions, with around half of the world's population at risk.

2. Leishmanias:
Leishmanias is caused by a protozoa parasite from over 20 Leishmania species. Over 90 sandfly species are known to transmit Leishmania parasites. There are 3 main forms of the disease: Visceral leishmanias, Cutaneous leishmanias, Mucocutaneous leishmanias. *Leishmania* parasites are transmitted through the bites of infected female phlebotomine sandflies, which feed on blood to produce eggs. Some 70 animal species, including humans, can be the source of *Leishmania* parasites. Leishmanias is endemic in various parts of the world, including parts of Africa, Asia, Europe, and the Americas.

3. Lyme Disease (spirochetes)
Lyme disease is caused by a spirochete—a corkscrew-shaped bacterium called *Borrelia burgdorferi*. It can affect any organ of the body, including the brain and nervous system, muscles and joints, and the heart. Lyme disease is a bacterial infection primarily transmitted by Ixodes ticks, also known as deer ticks or blacklegged ticks. These tiny arachnids are typically found in wooded and grassy areas. Lyme disease is primarily reported in parts of North America, Europe, and Asia.

4. Lymphatic filariasis [Elephantiasis]:
Lymphatic filariasis, commonly known as elephantiasis, is a painful and profoundly disfiguring disease. It is caused by infection with parasites classified as nematodes (roundworms) of the family Filariodidea that are transmitted through the bites of infected mosquitos. Mosquito-transmitted larvae are deposited on the skin from where they can enter the body. The larvae then migrate to the lymphatic vessels where they develop into adult worms, thus continuing a cycle of transmission. Lymphatic filariasis is endemic in many tropical and subtropical regions of the world, particularly in parts of Africa, Asia, the Western Pacific, and parts of the Americas.

5. Malaria:
Malaria is a life-threatening disease spread to humans by some types of mosquitoes. It is mostly found in tropical countries. Malaria mostly spreads to people through the bites of some infected

female Anopheles mosquitoes. Blood transfusion and contaminated needles may also transmit malaria. The first symptoms may be mild, similar to many febrile illnesses, and difficulty to recognize as malaria. Left untreated, P. falciparum malaria can progress to severe illness and death within 24 hours. Malaria is endemic in many tropical and subtropical regions of the world. Sub-Saharan Africa carries the highest malaria burden. Other regions with significant malaria transmission include parts of Southeast Asia, the Eastern Mediterranean, and the Americas.

6. Schistosomiasis:

Schistosomiasis is an acute and chronic parasitic disease caused by blood flukes (trematode worms) of the genus Schistosoma. People become infected when larval forms of the parasite – released by aquatic snails – penetrate the skin during contact with infested water. Transmission occurs when people suffering from schistosomiasis contaminate freshwater sources with faeces or urine containing parasite eggs, which hatch in water. Schistosomiasis is endemic in tropical and subtropical regions of Africa, South America, the Caribbean, the Middle East, and Asia.

7. Trypanosomiasis [Sleeping sickness]

Human African trypanosomiasis, also known as sleeping sickness, is a vector-borne parasitic disease. It is caused by protozoans of the genus Trypanosoma, transmitted to humans by bites of tsetse flies (glossina) which have acquired the parasites from infected humans or animals. Tsetse flies inhabit sub-Saharan Africa and only certain species transmit the disease. Rural populations which depend on agriculture, fishing, animal husbandry or hunting are the most exposed.

8. Typhus:

Epidemic typhus, also known as louse-borne typhus, is spread to people through contact with infected body lice, in contrast to endemic typhus which is usually transmitted by fleas. Both occur primarily in the colder, mountainous regions of central and east Africa, as well as Central and South America. The causative organism is Rickettsia prowazekii.